

THE SOCIO-ECONOMIC MOTIVES UNDERLYING TIPPING BEHAVIOUR

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ABSTRACT

Tipping is a unique phenomenon. There are various economic theories on the rationale behind tipping behaviour; two mainstream views are the narrow neoclassical view and the open-ended behavioural view. However, neither of these views provides complete explanations and insights into tipping behaviour. Tipping is a very important economic activity that accounts for a substantial part of our expenditures. Therefore the motives behind tipping should be a critical concern to us and there is a need to conduct in-depth analysis on tipping as an economic activity.

This study sets out to improve our understanding of tipping behaviour. In order to achieve this, possible socio-economic motives behind tipping are identified. There is an attempt to verify these motives with empirical evidence obtained in this study. A survey on restaurant tipping was designed and implemented, prompting respondents for their tip percentages as if they were dining in a restaurant. Using information so obtained, the socio-economic factors that influence individuals' tipping behaviour was determined by econometric analysis.

Based on the results of this study, individuals may be tipping to conform to social norms, to be altruistic and to encourage better future service. Service quality, the tipper's ethnic background and the tippers' area of study seem to be the major

determinants of tip percentages. Poor service is the main factor causing individuals to decide not to tip in a restaurant. An interesting finding is that individuals fail to accurately convert their expressed tip percentages to dollar amounts. This implies that individuals may be cognitively limited.

Another noteworthy outcome is that 26% of all respondents choose to tip even when service is poor and when they are dining in a restaurant they will never visit again. This leads to the concept of a core and marginal tip. Without future service considerations, the mean tip when service is poor can be viewed as the core tip that is likely shaped by social norms and altruism. The marginal tip can be viewed as the increment in tips when service improves. Results of this study lead to the conclusion that tipping is a multi-faceted phenomenon. It is influenced by a number of different motives; therefore it is better explained by a combination of neoclassical and behavioural theories.

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DEDICATION

...to Kevin, Cory, Mom and Dad

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CHAPTER 1

Introduction

1.1 Background

Tipping has existed in most parts of the world, and in most parts of the service industry. In North America, tipping can be considered as part of our daily lives. It accounts for tens of billions of dollars of expenditures in the United States and Canada alone. Tipping involves voluntary payments of money beyond any legal obligations. Because tipping is voluntary, the traditional narrow neoclassical assumption of selfish economic agents is challenged. Tipping is a unique phenomenon, since tips are given after the service has been provided. The major question about tipping is “why do people tip”? There are various explanations for tipping behaviour.

1.2 Objective

This thesis provides an economic analysis on tipping behaviour. The main objective of the thesis is to identify potential socio-economic motives behind tipping and to examine the validity of various hypotheses as to why individuals tip. One of

the objectives of this study is to find a better fit between theory and empirical evidence. An effort is also made to determine the effect of the tipper's gender, age, discipline, ethnicity, disposable income and different levels of education on tipping behavior.

The dominant view in narrow neoclassical theory is that tipping is solely incentive-based. However, behavioural economics suggests several potential motives for tipping other than incentives for better service. One such motive is tipping as a form of altruism. It is argued that people tend to maximize a utility function that incorporates altruism. Tippers may experience empathy for the worker, causing them to tip as a form of altruistic behaviour. A second hypothesis suggests people may choose to tip because they are conforming to existing social norms. They may also use tipping as a way to establish reputation or social status. People may also use social norms as a shortcut to determine tip amount.

1.2.1 Major Findings

Evidence from this study supports various hypotheses pertaining to tipping. Tipping does serve as a form of altruism. But place of origin and service quality are the two major determinants of tips. I found that individuals might tip to conform to existing social norms. They are also using tipping as an incentive for better service. It is evident that people tip for a variety of reasons. A combination of both

neoclassical and behavioural theories would best explain tipping behaviour.

According to my results, there may be a core component and a marginal component to tipping. The core is basically determined by social norm and altruism, while the marginal component is mostly determined by service quality. It is also found that individuals are cognitively constrained and are not good at complex calculations such as tip amounts. Therefore individuals may be using social norms as a shortcut.

1.3 Summary of Chapters

Chapter one is the introduction to the thesis. It provides a background on tipping and explains why research on tipping is important to our economy. A brief history of tipping is also included in this chapter. There is a discussion on the narrow neoclassical view as a benchmark for mainstream economics. Also included in chapter one is a summary of the issues discussed in the thesis.

Chapter two contains the review of previous literature. Results from previous empirical studies are presented in this section. Behavioural theories on tipping behaviour are discussed in this chapter.

The structure of the model and the functional form are presented in Chapter 3. There are detailed descriptions of the variables. I also explain the methods used

when analyzing the data in this chapter and state the expected results of this study based on results from previous studies.

Experiment design is described in Chapter 4. There are detailed descriptions of the surveying process, with reference to previous literature. A discussion on the design of the questionnaire is also included. There is a discussion on the potential biases in the experimental design.

Chapter five contains a summary of the data and the results. The data are analyzed in terms of means and variances, as well as econometric analysis. I discuss the sign, size and significance of the estimated coefficients. Results from this study are presented with reference to previous studies.

Concluding remarks are made in Chapter 6. The results of this research are summarized. I discuss the economic implications of my findings in this section. Suggestions for future research are also included.

1.4 The History of Tipping

1.4.1 Definition

A tip is something that is given voluntarily usually for some service after the service is delivered. Merriam-Webster Online Dictionary defines a tip as a gift or a sum of money tendered for a service performed or anticipated. It can also be

viewed as a gratuity. The word “tip” is sometimes considered as an acronym of “To Insure Promptness” or “To Insure Prompt” Service. Therefore, tips can be viewed as a device to improve service quality. According to Azar (2003.f), “the literature suggests that ‘tip’ may come from stipend, a bastardized version of Latin ‘stips’”. Azar also points out that some literature suggests that the eighteenth-century English phrase “tip me” has the meaning “give me”.¹

1.4.2 Early History

The reason for tipping may have changed over time. According to Lobb (2004), tipping first began in eating establishments and it was evolved from the giving of drink money to servers.² There are various versions for the origin and evolution of tipping. Some argue that the practice first started with customers wanting to avoid the envy on the part of servers, so the server would be given money from customers to have a drink. It then evolved to include the giving of gratuity to a servant employee by the eighteenth century. Another version suggests that tipping originated back in the late Middle Ages. According to Azar (2003.f), “a master or lord of the manor might give his servant or laborer a few extra coins, for either appreciation of a good deed or compassion for exceptional hardship arising from a large family, illness, and so on”. Tipping is found more recently in sixteenth

¹ This is one possible origin among the four different versions in previous literature.

² Lobb (2004) offered the origins of words meaning "tip" or "gratuity" in several languages.

century England. Coffee houses and pubs placed brass jugs with the inscription “To Insure Promptitude” on their counters. Customers had to tip in advance to ensure prompt service, by putting coins in these jugs.

The English word “tip” has existed for several centuries; the history of tipping behaviour itself may be even longer. Some historians claim that tipping was known as far back as the Roman era. Therefore it is reasonable to assume that tipping is deeply embedded in our cultural norms. The long history of tipping behaviour raises questions on the validity of narrow neoclassical assumptions. According to Azar, the first occasions of tipping could have been motivated by future service consideration, expression of gratitude or compassion, the desire to impress others and empathy for the worker.³

1.4.3 Modern Tipping

Tipping behaviour has evolved over time. According to Azar, “during the 1910s it was estimated that five million workers in the United States, more than 10% of the labor force had tip-taking occupations. Tips were estimated to total \$200 - \$500 million each year”.⁴ In the twenty-first century, tipping behaviour has become an important part of our culture. Lynn and McCall (2000) report that tips amount to

³ Azar (2003.f) argues that tipping is motivated by multiple motives. The neoclassical assumption of tipping being solely incentive-based is challenged.

⁴ Azar (2003.f) gives this statistics on tipping in the United States. Canada has a similar story, but tipping is less prevalent in Canada.

approximately \$16 billion a year in the United States alone. Although the amount of tips and the persons who are tipped vary from culture to culture, there are norms that most would follow. In general, people in the service industry are the ones that are being tipped. In North American culture, individuals are expected to tip their waiters or waitresses, bartenders, hairdressers, taxi-drivers, and the food delivery person. There are different tipping norms for each service, as illustrated in Table 1 below. Tipping exists in most parts of the service industry and not in other businesses. A major reason can be personal interaction; servers are given extra money to encourage effort. Excellent services in places such as restaurants and salons are rewarded in the form of tips, while other service providers like sales professionals are rewarded in the form of commissions and bonuses. These rewards are similar in nature because they are both intended to improve work effort.

Table 1: Guideline for Tipping in US or Canada

Service/ Server	Guideline
Waiter/ Waitress	15% of bill. 20% If it is a 4 star + restaurant or for large parties.
Bartender	\$1 - \$2 per drink. Or 10% – 15% of bill
Hair-dresser	15% of bill. \$1 - \$2 to person who shampoos or washes hair
Taxi-driver	15% of fare, no less than 25 cents. (Usually rounded to the dollar)
Food delivery person	\$1-\$2 if short distance \$2-\$3 for longer distances \$5 or more for large deliveries

Source: The original Tipping Page. <http://www.tipping.org>

People from different cultures and countries tend to tip differently; some cultures are more committed to tipping than others. For instance, tipping is not preferred in most of the local restaurants in China, while 15% - 20% of tips are expected in most Canadian restaurants. In most European restaurants, the norm is to tip 10%-15% if there is no service charge. Tipping is perceived as very insulting in Japan, while it is illegal to tip in countries like Argentina and Vietnam. Please refer to Table 2 for detailed tipping norms in different countries. The reason for the prevalence of tipping in some countries and not others can be cultural differences. For instance, Japan has a more rigid culture. They are likely to perceive tipping as insulting because it involves taking money from strangers, especially when the motive to tip is empathy. It is also evident that most developed countries are

committed to tipping. This can be due to their different culture and higher per capita income. Therefore tipping is more likely to prevail given wealth and the right culture.

Table 2: Worldwide Tipping Guide

Country	Restaurants	Porters	Taxis
Argentina	Tipping is illegal	None	None
Australia	10% in fine restaurants only	\$2 per bag	Round Up
Brazil	10 – 15%	\$1 per bag	10%
Canada	15%	\$1 - \$2 per bag	10%
China	3% in major cities	\$1 - \$2 total	None
Costa Rica	None	\$1 per bag	10%
Cuba	\$1 for special service	\$1 for special service	\$1 for special service
England	10% if no service charge	\$1 per bag	15%
France	5-10%	\$1 per bag	Round Up
Germany	5-10%	\$1 per bag	Round Up
Hong Kong	10% in addition to service charge	\$1 per bag	Round Up
India	10% if no service charge	\$1 per bag	Round Up
Ireland	10 – 15%	\$1 per bag	Round Up
Israel	12 – 15% if no service charge	\$1 per bag	12 – 15%
Italy	10% in addition to service charge	\$1 per bag	Round Up
Japan	Tipping is perceived as insulting	None	None
Kenya	5% if no service charge	50 cents per bag	None
Malaysia	None	None	None
Mexico	10-15%	\$1	50 cents
Morocco	Leave loose change	50 cents per bag	Round Up
Portugal	10% if no service charge	\$1 per bag	Round Up
Russia	10 – 15%	\$1 per bag	Round Up
Singapore	None	None	None
South Africa	10% if no service charge	50 cents total	10%
Spain	7 – 10% in addition to service charge	\$1 per bag	10%
Switzerland	Round up	\$1 per bag	Round Up
Taiwan	10% if no service charge	\$1 per bag	None
Thailand	None	None	None
United States	15-20%	\$1 - \$2 per bag	10 – 15%
Vietnam	Tipping is illegal	None	None
Wales	10% if no service charge	\$1 per bag	10%

Source: Magellan's Travel Advice

<http://www.magellans.com/jump.jsp?itemType=CONTENT&itemID=13132>

1.5 Historical View on Tipping

Historically, neoclassical theory represents the mainstream view on tipping.

However, standard neoclassical theories fail to completely explain tipping behaviour.

Economists have paid little attention to tipping as a result.

1.5.1 Narrow Neoclassical Perspective

Narrow neoclassical theory assumes individuals to be selfish and constantly calculating to maximize utility. Emotions do not enter into the maximization exercise. According to Simon (2002.a), neoclassical economics assumes individuals to be unboundedly rational, have unbounded will-power, and the consequences of alternatives are always known completely with certainty.⁵ This suggests that human beings are not constrained by any cognitive limitations when making decisions. Simon does not agree with such assumptions.

According to utility maximizing theory of narrow neoclassical economics, a rational choice is the choice that yields the greatest utility among a given set of alternatives. As Becker (1998) points out, “rational consumers maximize utility from stable preferences as they try to anticipate the future consequences of their choices”. An individual maximizes a utility function such as $U = f(X, Y, Z \dots)$,

⁵ Every economic agent knows a joint probability distribution of outcomes.

where the variables X , Y , and Z are baskets of consumption goods. Service can be viewed as consumption good, therefore narrow neoclassical theories allow for individuals to be tipping to improve future service. According to the narrow neoclassical view, individuals only use tipping as incentives for better future service. On the other hand, behavioural theory takes into account that individuals may be tipping because of social norms and altruism. The “warm glow” people get from tipping also fits into the behavioural perspective wherein the utility function incorporates non-material maximizing behaviour.

CHAPTER 2

Review of Literature

Behavioural economics offers various theories that attempt to explain tipping in addition to the incentive hypothesis specified in neoclassical theory. Behavioural theories can be viewed as an enrichment of neoclassical theory. Tipping is a complex behaviour that is probably driven by multiple motives. It is not in the scope of this thesis to test in detail the different hypotheses pertaining to tipping. Rather, the main objective of this study is to understand these motives better. The first hypothesis to be explored is that tipping can be a form of altruism. Individuals can be maximizing a different utility function than the one specified in simple neoclassical economics. The second hypothesis states that tipping behaviour can be affected by cultural and social norms. Individuals who tip may be conforming to existing social norms. The third hypothesis is tipping is an incentive for better service.

Economists Ben-Zion and Karni (1977) are pioneers in building a model of tipping. Their work is based on the repeated interaction between customers and servers.⁶ The customers choose the amount to tip and the servers choose their effort

⁶ According to Azar (2003), Ben-Zion and Karni (1977) were the first to offer an economic model of tipping based the theoretical framework of repeated interaction.

level. One important aspect of their model is the argument that the marginal reward for effort must be positive in order to induce higher-than-minimal effort by servers. Repeated interaction between customers and servers is crucial to ensure positive marginal rewards for effort. According to their model, tipping behaviour can be considered self-interest seeking for customers who would frequent the same restaurant.

2.1 Hypothesis A: Tipping as Altruism

Altruism represents self-sacrificing behaviour that deviates from the expectations of mainstream economics. According to Collard (1978), the assumption of self-interest ignores those non-selfish elements of his behaviour of which man has always been conscious.⁷ Some economists argue that people are altruistically inclined, so there is a tendency for wanting to help those in need. Tipping can be a form of altruism. Waiters and waitresses are often people who earn lower income, as well as other workers who are in similar positions in the service industry. Individuals may want to help out the “poor” waiters or waitresses in the form of tipping. In a large group, there may also be altruistic feelings toward other dinner companions. A person may choose to tip more if fellow diners in the group have low income so they can contribute less. This is also consistent with the

⁷ The standard assumption of self-interest is simply a special case.

altruism hypothesis.

2.1.1 Maximizing different utility function

Individuals' utility functions can be expanded to include moral aspects of human life. There are things other than material goods that will yield utility. Altruism can be included as a component because engaging in altruistic behaviour seems to give people positive utility. As Hausman and McPherson (1996) point out, sometimes people also want to benefit or harm other people; they may care about the esteem and affection of others more than about the size of their houses or their style of their clothing even when self-interested. A utility function that includes altruism can be specified as $U = f(X, Y, Z, A, \dots)$, where X , Y and Z are material goods and A is altruism. Becker also discusses altruistic behaviour as a result of such a utility function. According to Becker, " i transfers resources to j that are earmarked for particular goods consumed by j because the utility function of i depends not only on his own goods but also on these goods of j ".⁸ If altruistic behaviour and tipping are products of maximizing this alternative utility function, tipping can definitely be justified in a broader neoclassical sense.

Tipping can be a form of altruism, but it is not necessarily unconditional. Andreoni developed a model of giving in which altruism is not "pure". In his

⁸ Becker (1998) p.114. He developed a model that incorporates social norms and past experiences.

model, people are assumed to get a “warm glow” from giving.⁹ Tippers can simply be altruistically inclined, or they can also get a warm glow from tipping.

Andreoni’s “warm glow” hypothesis is a powerful approach to altruistic behaviour.

It is consistent with the neoclassical assumption of utility maximizing economic agents. It is also supported by empirical studies such as Andreoni (1989).

Bryant and Smith (1995) carried out a study on tipping behaviour in the early 1990s in a restaurant in the United States. The main purpose was to investigate the importance of different variables that might affect a waiters’ or waitress’ tip amount. The restaurant was part of a national chain that was located in a suburban shopping mall. The restaurant served a varied menu and was divided into smoking and non-smoking sections. A food server recorded the data on all customers they served over a period of two and a half months. There were 244 observations recorded on the size of the bill, tip amount, sex of tipper, day of the week, size of the party, whether it was day or night, and whether there was a smoker in the party.

According to their results, there is a tendency to give smaller tips rather than larger tips relative to the total bill. The average tip rate was only 16.1%, while it is usually between 15% -20% in North America. There is also a tendency to round the tip to the nearest dollar. There is much more variation in the tips given by smoking

⁹ Andreoni (1989) introduces the “warm-glow” hypothesis in his article. The “warm-glow” can be viewed as the positive feeling about oneself when doing good deeds.

parties than non-smoking parties; female smokers tend to tip more. The largest tip (71%) and the next largest (42%) were both given by smokers on Saturday nights in parties of two people.¹⁰ Size of the party appears to be the most important factor in predicting tip rate. There is a decreasing trend in tip rate as the size of the party increases. It was also found that the total bill and tip amount are highly correlated.

2.1.2 Basic Needs Generosity

The result obtained by Bryant and Smith (1995) is consistent with basic needs generosity in behavioural economics because of the tendency to give small tips. Individuals who choose to engage in altruistic behaviour often have a preference for donations that meet basic needs. It is unlikely for economic agents to give very large donations, unless the recipient is thought to be very deserving. There is a tendency for the amount of donations to increase as the social distance between individuals is perceived as smaller. Therefore, people tend to be more generous towards servers that they can relate to. As Lynn, Le and Sherwyn (1998) point out in their study, restaurant customers who have been briefly touched by a server have been found to evaluate the server more favorably and to leave larger tips. This is also consistent with the strong reciprocity in behavioural economics because individuals tend to tip more to people that they can relate to.

¹⁰Information on the study is collected from Bryant and Smith's online article. Details on the results are also available, although the raw data are not provided.

2.1.3 Strong Reciprocity

Strong reciprocity means a propensity to cooperate and share with others similarly disposed, and a willingness to punish those who violate cooperative and other social norms.¹¹ Tipping can be used as such a device. Large tips can be a reward for good service; small tips or no tips at all can be punishment for poor service quality. If there are social norms in place for the level of service expected in restaurants and other places, those who serve below the standard can be perceived as violating social norms. Customers can respond by choosing not to tip or tipping very little. Choosing not to tip in this case is consistent with the desire to punish others who violate social norms, as specified in strong reciprocity.

2.2 Hypothesis B: Tipping as a Social Norm

Tipping can be analyzed as a tendency for individuals to conform to existing social norms. Every society has its own norms. People tend to approve of behaviour that complies and disapprove of behaviour that violates such norms. Those who violate social norms typically experience negative feelings of guilt or

¹¹ Bowles and Gintis (1998) discuss strong reciprocity as a behavioural concept. In short, it is the tendency to enforce social norm on everyone and to punish those who fails to conform.

shame.¹² Therefore individuals in a society may be pressured to conform to these norms, although the individual may prefer to behave differently. The norms in North America often require individuals to tip 15% to 20% at a restaurant. According to Bryant and Smith (1995), there is a tendency for individuals to tip close to the minimum of what is expected. This may evince that people are not very willing to tip, but they are constrained by social norms to do so. There is also disutility involved in the action of stiffing (not tipping) caused by embarrassment and other factors. Therefore individuals may tip to “buy social approval or avoid social disapproval from servers and fellow diners”.¹³

2.2.1 Bounded Rationality

Tippers may be using social norms as a shortcut to determine tip percentages. Simon (2002.b) argues that information is asymmetric and there are costs associated with obtaining information.¹⁴ There are also physiological limitations to human capacity to process information. The general public may not be informed about the effectiveness of using tipping as incentives for better service. Moreover, it could be costly to obtain and process such information. Tipping according to social norms is

¹² According to Hausman and McPherson (1996), moral norms enable people to coordinate their actions more efficiently than would be possible without a shared morality.

¹³ Bodvarsson and Gibson (1994) also agree that there is disutility associated with not tipping.

¹⁴ We have to take into account the cognitive limitations of the decision-maker -- limitations of both knowledge and computational capacity.

low-cost, so individuals may choose to use social norms as a guide. Bounded rationality may cause tippers to satisfy and to tip according to the perceived social norms, rather than to tip according to the actual service level and the tipping-service relationship. If individuals are indeed tipping as conforming to social norms, one can conclude that tipping behaviour is somewhat shaped by our culture. Evidence suggests tipping behaviour will change if individuals are in another culture.

2.2.2 Tipping to Establish Reputation

One explanation for tipping behaviour is that it can be based on reputation building. If the culture approves of generous tipping, tippers will have an incentive to tip well in order to establish reputation. According to Collard (1978), some people engage in material sacrifices to establish reputation. Individuals express desires to impress the server and others in the party by tipping generously. Previous literature on tipping has shown an increasing trend in tip percentages. Azar (2003.e) suggests the increase is evidence that people derive benefits from tipping, such as impressing others and improving their self-image as being generous and kind. According to Bryant and Smith's study, there is a tendency for the tip rate to decrease as party size increases. If party size is larger, there may be many people sharing the bill. Giving "cheaper" tips may not be as obvious or as embarrassing as compared to when there are fewer people. The person can also tip less since his or her

contribution is hidden. There is an incentive to free-ride, resulting in a lower percent tip. If the party size is smaller, there is a greater need to impress. The tipper is able to make much stronger impressions by tipping generously, earning more respect from the server and others in the party. The person is also more likely to receive better services next time, if he or she often goes to that same restaurant.

Bodvarsson and Gibson (1994) built an economic model to discuss issues that previous literature fails to address properly. Their model is based on the hypothesis that tip amount depends on service, bill size and patronage frequency. To ensure precise analysis, they separate service into service quality and service quantity. Service quantity measures how much service was provided (i.e. how many times the server brought over food and drinks), while service quality measures how good the service was (i.e. did the server smile when greeting customers). They then tested their model with survey data. The survey was conducted in seven restaurants in Minnesota. Approximately 700 observations were recorded on tip amount, bill size, patronage frequency, number of entrees, number of drinks, number of appetizers, number of desserts and quality of service. The results suggest service quality has little effect on tip percent. To a large extent, service quantity reflects and measures the server's effort level. One would also expect service quality to effect tip percent, since it is another major indicator of effort. Bodvarsson and Gibson argued the

insignificance of service quality effect on tipping is caused by the excellent service rating by most respondents.¹⁵ Tip percent also depends on bill size, which is highly correlated with service quantity. Their results shows that tippers calculate tips with respect to service, they do not just leave a fixed percentage of tips as specified by the social norms hypothesis. A significant finding here is that the tip amount has little relationship with patronage frequency. This is contrary to the results of previous studies such as Lynn and Grassman (1990). This weak relationship can also be viewed as evidence for the “social norm” hypothesis. If customers are tipping to conform to social norms, they will tip even when future service is not a consideration, which happens during low patronage frequency.

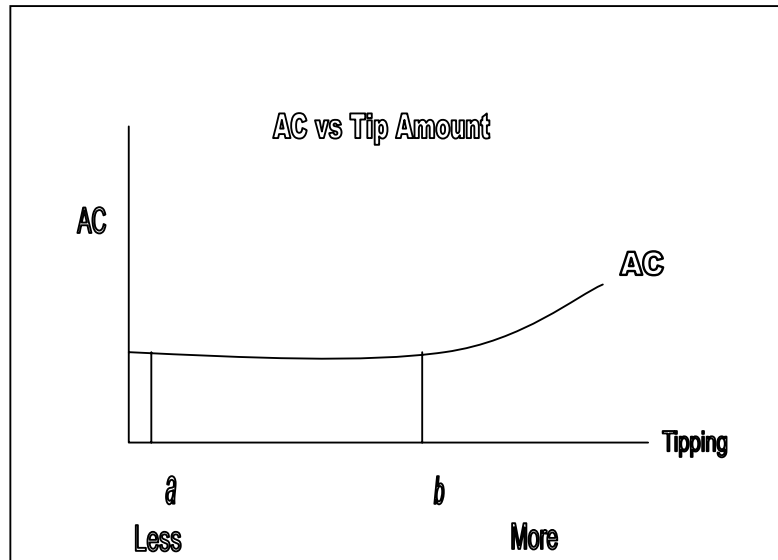
2.3 Hypothesis C: Tipping as Incentive

Tipping can also be used as an incentive for servers to provide higher quality service. If the amount of tips a server receives is determined by the service quality he or she provides, there is definitely an incentive for the server to put in more effort—an important argument is made by Leibenstein’s x-efficiency theory. In x-efficiency theory, effort is variable as opposed to being fixed at some optimal

¹⁵ Bodvarsson and Gibson (1994) found that tip heavily depends on service quantity but not service quality. Another explanation is that service quantity is more visible and measurable than service quality.

maximum assumed in neoclassical economics. According to Leibenstein (1966), “the simple fact is that neither individuals nor firms work as hard, nor do they search for information as effectively, as they could”. A typical firm’s average cost as specified in x-efficiency theory can be written as $AC = W / (Q/L)$ —this is a simple model wherein labour is the factor input (average cost equals to wage divided by the output-labour ratio). By looking at the consumer’s side, the average cost of tipping can be perceived as the amount of tips divided by service quality ($AC = \text{Tip} / \text{service quality}$). If tipping can indeed work as an incentive for more effort, the average cost of tipping to the customer does not necessarily need to be higher as tipping increases. (As demonstrated with Figure 1) The cost of tipping more can be balanced out by higher service quality. To a certain extent, average cost can stay at the relatively constant level even when tipping increases. As Leibenstein (1966) points out, changes in incentives will change productivity per person and cost per unit of output. This is demonstrated clearly by a wide variety of studies in the effects of introducing payments by results schemes. Tipping can also be viewed as part of such schemes.

Figure 1



Lynn and Gregor (2001) perform a study on hotel bellmen to determine the relationship between tipping and service quality. A relationship is critical for tipping to work as an incentive. The study was not conducted in the typical restaurant setting, but in a small luxury hotel in Ithaca, New York. The hotel bellman was requested to randomly deliver either “limited” or “full” service to the guests. In the “limited” service condition, the bellman greeted the guests, carried their luggage, accompanied the guest to their room, brought the luggage into the room and offered extra help as needed. In the “full” service condition, the bellman also showed the guest how to operate the television and the thermostat, opened the drapes for the guests, and offered to bring the guests ice from a machine down the corridor. Fifty observations were recorded on tip amount, sex of the guest, apparent age of the guest and whether the guest was provided “limited” or “full” service.

According to Lynn and Gregor (2001), the average tip was \$4.77 in full service condition and only \$2.40 in limited service condition. The hotel bellman nearly doubled his tip amount by performing several additional tasks. The service effect was found to be very big in the study of hotel bellmen. The large service effect may be explained by weaker social pressure on the tipping of hotel bellman. Customers can choose freely between tipping and not tipping, so the service quality matters. The large service effect can also be explained by effort level. The ordinary job of a bellman does not require a lot of service, and the bellman can easily choose to increase his or her effort level. The study shows tipping can be used as an incentive for higher service quality.

2.3.1 Optimality and Implicit Tipping Contract

Some economists also suggest tipping as a way to reach optimality that the market system fails to achieve. Therefore, tipping can be analyzed as an efficiency enhancing social and behavioural norm. In other words, the people in society collectively choose tipping as a form of equilibrium selection. Although explicit tipping contracts between customers and servers will enable the market to work efficiently, there are high transaction costs in imposing such a scheme. Tipping norms can easily work as substitutes for tipping contracts, at zero transaction cost. If the tipping norm works as an effective contract, then tipping will serve its purpose.

Servers will provide better services, and tippers will tip the amount that is thought to be fair. According to Azar (2003.c), tipping is a social norm created to improve welfare where the market fails. Azar proves his view using a model in which a waiter chooses service quality and then a customer chooses the tip.¹⁶ Tipping improves social welfare in all cases by increasing service quality. Therefore, tipping can effectively induce higher service quality.

To investigate the efficiency of tipping, Lynn, Conlin and O'Donoghue (2003) conducted a study on restaurant tipping. Customers were asked to complete a survey as they were leaving the restaurants. The survey was done outside of 39 different restaurants in Houston, Texas, during approximately the same times at night. There were 1393 observations recorded on tip amount, bill size, party size, gender of server, gender of tipper, age of tipper, service quality, food quality, number of courses ordered, whether alcohol was consumed, number of times the tipper frequent that restaurant and number of times the tipper frequent any restaurant. According to the results of the study, the average percent tip is 17.56%. It is consistent with the 15%-20% norm perceived by North Americans. Lynn, Conlin and O'Donoghue (2003) found that the average party size is 2.37, while the average bill size was \$26.42. According to the estimated model, tip amount tends to decrease with bill

¹⁶ Such a model was used to determine whether high and low sensitivity of tips to service quality increase service quality and social welfare.

size. This is consistent with the findings by Bryant and Smith and the expectations of basic needs generosity. Percent tip is also found to increase as party size increases, which suggests people may be tipping to establish reputation. Percent tip decreases with the age of the tipper. Tippers who often dine at full-service restaurants tend to leave higher percent tips. Frequency of visits to full-service restaurants could be an indication of tipper's income; therefore it is possible that tippers with higher income tend to leave larger tips. The results obtained also provide evidence that tips tend to increase with the level of service. This indicates a strong relationship between tip percent and service. The results also suggest that tip amount depends on repeated interaction. It is found that percent tip also depends on "noise", which includes variables that are not controlled by the server. Noise represents factors that affect the relationship between the server's effort and customer's perceived service quality (i.e. the speed of preparing food in the kitchen). Since literatures suggest noise should not have significant effects on efficient tipping contracts, Lynn and others conclude that tipping norms do not work fully efficiently as implicit tipping contracts.

However, Azar obtained contrary results in his study. Survey data were used to test a model that incorporates the disutility of stiffing and allows tipping to be motivated by future service considerations. The data were collected in 6 different

restaurants in United States, by surveying customers as they leave the restaurants. There were 597 observations recorded on bill size, tip size, service quality and patronage frequency. According to Azar (2001.a), if customers use tipping as incentive for better services, then the sensitivity of tips to service quality should increase with patronage frequency. However, the results of the study show patronage frequency has no effect on the sensitivity. Moreover, frequent and non-frequent customers tend to tip in similar fashions, given same level of service quality. This is evidence that customers do not use tipping as incentive for the servers to provide quality service in the future. Azar also concludes that social norm is the major determinant of tips, according to the model presented in the study.

2.4 Meta-analysis on Empirical Studies

There have been numerous empirical studies done on tipping and restaurant tipping in particular. Although the results vary from study to study, some general conclusions can be drawn on the findings. Lynn and McCall (2000) conduct a meta-analysis on research studies of restaurant tipping. They identify relevant studies by performing computerized searches of four different databases. They further contacted the authors of those studies for additional studies they have performed on the topic. In Lynn and McCall (2000)'s study, the relationship

between tip size and service was assessed in a meta-analysis of 7 published and 6 unpublished studies involving 2,547 dining parties at 20 different restaurants.

Restaurants are used as their unit of analysis, as it is deemed to be more appropriate than the usual use of studies as a unit. The different restaurants are located in nine different cities across the United States. Lynn and McCall obtain raw data for the 13 studies. They attempt to re-analyze the data to determine relationships that were not investigated in original research. Data in original studies are obtained through server records, survey and interviews. The estimated relationship between service quality and tipping by meta-analysis is summarized in Table 3.

Table 3: Statistical Summary of Service-Tipping Relationship by Type of Service Evaluation Used

Type of Service Evaluation	Number of Tests	Total Sample Size	Mean R ¹	Combined Z	Test of Effect Size Heterogeneity
Customer Rating of Service on a Multi-Item Scale	4	406	.22 ^a	4.19 (p<. 0001)	X ² (3)= 4.25 (n. s.)
Customer Rating of Service on a Single-Item Scale	10	1060	.11 ^b	3.63 (p<. 0003)	X ² (9)= 13.54 (n. s.)
Non-Customer Rating of Service	3	593	.04 ^b	.95 (n. s.)	X ² (2)= 0.99 (n. s.)
Rating of Dining Experience	6	488	.05 ^b	1.52 (n. s.)	X ² (5)= 8.67 (n. s.)

¹ Mean Effect Sizes with different superscripts are significantly different from one another at the one-tailed 0.5 level.

Source: Lynn and McCall (2000)

The result of the meta-analysis slightly deviated from various studies done by Michael Lynn himself and other scholars. According to the results obtained in the meta-analysis, the mean effect size R is 0.11 and the combined z is 3.63 for the service-tip relationship. One can conclude that there is a small, but positive relationship between tip amount and customers' evaluation of service quality. However, the relationship is so weak that one can conclude the service effect on tips is minimal. The mean R in ten tests were only 0.11, which means the average correlation between tip amount and customers' evaluation of service quality was only 0.11. Tests are also performed using customer ratings of service on multi-item scales instead of single-item scales to control for methodological characteristics. The mean R in such tests is 0.22, which is much larger than the mean R in single-item scale tests. However, the size of the estimated coefficient is still too small to be economically important. A much stronger relationship was expected in behavioural theory. Other studies obtained higher service-tip relationship coefficients, including Lynn and Gregor (2001). Similar results obtained in the single-item and multi-item scale tests imply the results are consistent across restaurants and studies. Tests have also shown the results obtained through the meta-analysis are statistically significant, so the results are reliable.

In another meta-analysis on tipping literatures, Lynn and McCall (1997) obtained similar results. The purpose of the research was to determine the predictors of tip size in conventional restaurant settings. A total of 22 published and 14 unpublished studies were examined. They were able to obtain raw data for 15 of 22 published studies and 10 of 14 unpublished studies. There were also attempts to re-analyze the data to determine relationships that were not investigated in original research. The estimated correlation coefficient for relationship between bill size and tip amount is 0.83. It was the single best predictor of tips in the analysis. According to Lynn and McCall, it is apparent that consumers left larger bill-adjusted tips when they were frequent patrons of a restaurant (mean $R = 0.9$). Estimated coefficient for the relationship between service quality and bill-adjusted tips is positive, but the number is insignificant (mean $R = 0.12$). This result is consistent with the findings of the previous meta-analysis. From the results of the study, Lynn and McCall further conclude that social expectations, server attractiveness, server friendliness and customer mood were the major determinants of tip amount. Service quality only has a minor effect on tips. The results of this meta-analysis confirm the finding of a weak service-tip relationship in previous studies by Lynn and McCall, which deviates from the results obtained by Bodvarsson and Gibson (1994).

2.5 Ethnic Differences on Tipping

Since a big part of the analysis of tipping is based on social and cultural norms, it is not surprising that people from different parts of the world exhibit different tipping behaviour. Do people from a culture that approves of tipping tip more than people from other cultures? A survey in the United States shows that the majority of servers will categorize Hispanics, Blacks and Asians as poor tippers. Almost none of those servers will categorize Caucasians as poor tippers. It is important to determine whether the variations in tipping behaviour of people from different ethnic groups are caused by cultural differences or other factors (i.e. discrimination by servers based on misperception).

Research was conducted for American Demographics Magazine to study the difference in tipping behaviour between Blacks and Whites in the United States. The study was conducted through a national telephone survey with a sample size of 1005. Individuals who participated in the survey were asked questions about their usual tip percentages and their ethnic group. Results of the study are summarized in Table 4. According to the results, 80.6% of the White respondents and 49.3% of Black respondents described their tips as a percentage of the bill. Whites are more likely to describe their usual tips as percentages. Furthermore, Lynn and

Thomas-Haysbert (2003) point out that “among those who did describe their usual tips as a percentage of the bill, Blacks reported leaving smaller percentage tips than did Whites (mean rank = 249.31 vs. 332.06)”.

Table 4: Responses Broken Down by Ethnicity of Respondents

Variable/ Level	White Respondents	Black Respondents
<u>Tip Type</u>		
Dollar Tip	N = 149 (19.4%)	N = 37 (50.7%)
Percentage Tip	N = 618 (80.6%)	N = 36 (49.3%)
<u>Dollar Tip</u>		
\$1 - \$2	N = 89 (59.7%)	N = 23 (62.2%)
\$3 or more	N = 60 (40.3%)	N = 14 (37.8%)
<u>Percentage Tip</u>		
<15%	N = 64 (10.4%)	N = 5 (13.9%)
15%	N = 362 (58.6%)	N = 29 (80.6%)
>15%	N = 192 (31.1%)	N = 2 (5.6%)

Source: Lynn and Thomas-Haysbert (2003)

This difference in tipping behaviour between Blacks and Whites can be caused by various factors. According to Lynn and Thomas-Haysbert, one possible explanation is that ethnic minorities are less familiar with, or committed to the 15% to 20% tipping norm in North America.¹⁷ Blacks and other ethnic minorities will tip less than the norm if they do not know of, or agree with such norms. Another possible explanation is the income effect on tipping. Ethnic minorities tend to be in lower income groups. They also have larger family sizes and more dependent

¹⁷ According to Michael Lynn and Clorice Thomas-Haysbert, familiarity with social norms is a main factor causing tipping differences.

children in general. Given less income, it is less likely for people from those ethnic groups to tip larger amounts even if they prefer to because it is not very affordable.

A third explanation is racial discrimination. If servers believed that ethnic minorities are poor tippers, they are not likely to provide higher quality service to those customers. Since tip amount does reflect service quality, customers from ethnic backgrounds will not tip much as a result of poor service. Tipping does not work well as an incentive to induce better service for ethnic minorities because tips are post-service payments. Servers do not know if customers will tip well when they provide service. Therefore, if ethnic minorities are categorized as poor tippers, whether they tip well or not cannot affect the server's effort level.

2.6 Difference between Male and Female

Previous studies on restaurant tipping also show a difference in male and female tipping behaviour. This may be caused by the different social norms imposed on men and women. The traditional society often requires men to be paying bills when they are with women, therefore male tippers may be more familiar with tipping norms. There is also social pressure for men to be on the generous side when they are on dates with women. According to Bryant and Smith (1995), female tippers have a slightly higher tip rate than males. The average female tip

rate is 16.6%; the average male tip rate is only 15.8%. The study from Lynn, Conlin and O'Donoghue (2003) also suggests that tip percentage is influenced by the gender of the tipper. The estimated coefficient of the gender of tipper on tip percent is 0.215, while the t-statistics value is 0.698. The estimated coefficient may not be very large, but it shows that gender can have some influence on tipping. The significant t-value indicates the results are statistically reliable. According to Lynn and McCall, the average bill-adjusted tips left by men were larger than those left by women (mean $R = 0.6$). One possible explanation is that female servers greatly outnumber male servers in food industry. There may be a motive for male customers to tip more in order to impress the opposite sex (female servers). Friedman and Cassar (2004) also point out that a previous study found that men tip better than women in smaller bills. From the results of previous studies, one can expect male consumers to leave larger tips than female consumers.

2.7 Age Difference on Tipping

People in different age groups may choose to tip differently. Some of the previous studies briefly discussed the effect of tipper's age on tipping behaviour, but there are no major findings available. Evidence shows that there are differences in tipping behaviour of younger and older people. Previous studies on tipping have

shown that young adults tend to tip more than middle-age tippers.¹⁸ This tendency may be caused by younger people's stronger desire to impress the server and others. Moreover, young adults are less likely to be constrained by family and financial burdens, so they are able to tip more.

2.8 Effect of tipper's area of study on tips

People from different areas of study or discipline may exhibit different tipping behaviour. However, no previous study discussed the effect of tipper's discipline on tips. No previous empirical results can be presented; therefore no expectations can be formed based on these results. One may expect students majoring in economics and commerce to tip more because they are likely to believe in incentives. Tipping behaviour may vary depending on the consumer's knowledge and beliefs on the act of tipping. Students who major in economics, commerce or psychology are expected to have more insights into tipping than students in other disciplines. However, Frank (2005) also argues that students in economics are more selfish than students in other areas of study. They are also less likely to engage in altruistic behaviour.

¹⁸ According to results obtained by Michael Lynn and other economists in studies that recorded the apparent age of tippers. These studies include Lynn, Conlin and O'Donoghue (2003).

2.9 Effect of tipper's income on tips

One of the potential motives behind tipping is altruism. If people derive utility from the act of tipping, then tips can be viewed as a normal good. Tippers can determine their optimal tips by doing a cost-benefit analysis. Tippers who earn higher income should tip differently than those of low income. Their cost of tipping is relatively low; therefore they may choose to tip more. No previous study has focused on the tipper's income effect on tip amount, and other studies that briefly discuss the topic do not provide conclusive results. Although the previous literature were not successful at analyzing the effect of tipper's income on tips, there are some indications that high-income tippers may tip more.

CHAPTER 3

Model and Variables

In this chapter, I present the model developed for this research. Definitions of various variables in the model are given. I attempt to verify the inclusion of these variables with behavioural theories when developing the model. Detailed descriptions of the variables and their relationship with tipping are also provided. In the last section, I state the expected results of this research with respect to results from previous studies.

3.1 The Model

3.1.1 Functional Form

$$Y = \alpha + \beta X$$

Table 5 gives a list of the specified variables in the model and their definitions.

Table 5: Description of Variables

Variable	Definition
Tip	Tip Percentage (Dependent Variable)
Age	Respondent's age
Male	Dummy variable for sex (Female=0; Male=1)
AsianOrigin	Dummy variable for place of origin (Canada=0; Asia=1; Other=0)
OtherOrigin	Dummy variable for place of origin (Canada=0; Asia=0; Other=1)
Humanities	Dummy variable for major (Economics=0; Humanities=1; Natural Sciences=0; Social Sciences=0; Commerce=0; Other Major=0)*
NatScience	Dummy variable for major (Economics=0; Humanities=0; Natural Sciences=1; Social Sciences=0; Commerce=0; Other Major=0)*
SocScience	Dummy variable for major (Economics=0; Humanities=0; Natural Sciences=0; Social Sciences=1; Commerce=0; Other Major=0)*
Commerce	Dummy variable for major (Economics=0; Humanities=0; Natural Sciences=0; Social Sciences=0; Commerce=1; Other Major=0)*
OtherMajor	Dummy variable for major (Economics=0; Humanities=0; Natural Sciences=0; Social Sciences=0; Commerce=0; Other Major=1)*
Graduate	Dummy variable for education level (Undergraduate=0; Graduate=1)
Income	Respondent's average monthly income (after-tax)
HousNPaid	Dummy variable tracking whether or not a respondent's housing expense is being paid for by a third party (Yes=0, No=1)
TuitNPaid	Dummy variable tracking whether or not a respondent's tuition is being paid for by a third party (Yes=0, No=1)
InfreqRest	Dummy variable for patronage frequency (Frequent Restaurant=0; Restaurant respondent will never visit again=1)
DineAlone	Dummy variable for group size (Dining alone=1; Group of 2=0; Group of 10=0)
Dine10ppl	Dummy variable for group size (Dining alone=0; Group of 2=0; Group of 10=1)
ExcServ	Dummy variable for service quality (Excellent service=1; Average Service=0; Poor Service=0)
PoorServ	Dummy variable for service quality (Excellent service=0; Average Service=0; Poor Service=1)
Inc>25000	Dummy variable for server's annual income (Income less than \$10000=0; Income over \$25000=1)
Bill\$100	Dummy variable for bill size (\$10 bill=0; \$100 bill=1)

*Categorized by different program types in the University of Saskatchewan Course Calendar

Equation 1 includes the dependent variable Tip and independent variables Age, Male, AsianOrigin, OtherOrigin, Humanities, NatScience, SocScience, Commerce, OtherMajor, Graduate, Income, HousNPaid, TuitNPaid, InfreqRest, DineAlone, Dine10ppl, ExcServ and PoorServ.

Equation 2 includes the dependent variable Tip and independent variables Age, Male, AsianOrigin, OtherOrigin, Humanities, NatScience, SocScience, Commerce, OtherMajor, Graduate, Income, HousNPaid, TuitNPaid, InfreqRest and Inc>25000.

Equation 3 includes the dependent variable Tip and independent variables Age, Male, AsianOrigin, OtherOrigin, Humanities, NatScience, SocScience, Commerce, OtherMajor, Graduate, Income, HousNPaid, TuitNPaid, InfreqRest and Bill\$100.

3.1.2 Base Group

The same base group is used for all 3 equations. Personal characteristics with the most occurrences are chosen as the base group (i.e. undergraduate female respondents from Canada majoring in economics with housing and tuition paid for by a third party). I also choose the most common scenario as the base group when running regressions. The base group is assumed to be in a frequented restaurant, dining in a group of 2, provided with average service, given a \$10 bill and served by a server with annual income less than \$10000.

3.2 Variable Description and Expected Results

- **Tip** is the continuous dependent variable in the model. Participants were asked to provide the percent tip they would tip in various situations.
- **Age** is one of the two continuous variables in the model. It is the age of the participants as it was provided in the questionnaire. A negative but small coefficient is expected because of evidence in previous studies (as mentioned in Chapter 2).
- **Male** is the dummy variable for the sex of the participants. I expect a small and positive coefficient for this variable because of the results from Lynn's studies. In Lynn, Conlin and O'Donoghue (2003)'s study, the estimated coefficient of the gender of tipper on tip percent is 0.215, while the t-statistics value is 0.698. Lynn and McCall also found that the average bill-adjusted tips left by men were larger than those left by women (mean $R = 0.6$).
- **AsianOrigin** and **OtherOrigin** are the dummy variables for the participants' background. OtherOrigin includes people who are from neither Canada nor Asia. A large and negative coefficient is expected because of evidence in previous studies mentioned in Chapter 2.
- The dummy variables **Humanities**, **NatScience**, **SocScience**, **Commerce** and

OtherMajor account for the effect of the participants' discipline on tipping.

SocScience includes all the students in a social program, except for economics.

OtherMajor includes students who are not in the College of Arts and Science and Commerce. Students majoring in economics may exhibit different tipping behaviour than students in other areas study since they have more knowledge on tipping as an economic behaviour. However, no previous study discussed the effect of tipper's area of study on tips. I expect negative coefficients for all these variables, except for commerce students. Commerce students may have knowledge on tipping as a market activity. However, Frank (2005) suggests a positive coefficient because of economists' supposedly selfish nature.

- The dummy variable **Graduate** denotes whether the participants are graduate students. This is a discipline-related variable that is associated with the participants' tipping knowledge. I expect a small and positive coefficient since graduate students tend to have more experience with tipping.
- **Income** is another continuous variable in the model. No previous study has focused on the tipper's income effect on tip amount, and other studies that briefly discussed the topic did not provide conclusive results. Although previous literatures were not successful at analyzing the effect of tipper's income on tips, there are some indications that high-income tippers may tip

more. Therefore a positive and moderate size coefficient is expected in this study.

- **HousNPaid** and **TuitNPaid** are income-related dummy variables. They are included to account for the fact that some participants have fixed expenses.

Not all of their after-tax income is disposable income. I expect small and negative coefficients for these variables because tippers with higher disposable income should be tipping more.

- **InfreqRest** is the dummy variable associated with patronage frequency.

Disutility is associated with violating a social norm. It is assumed that tippers feel less embarrassed to not tip at a restaurant that the tipper would never go to again. If tip percentages increase with patronage frequency, it is possible that tippers are conforming to social norms. Tipping also works better as an incentive for quality service in a frequent restaurant. As mentioned in Chapter 2, Bodvarsson and Gibson found little relationship between patronage frequency and tipping in their study. Azar (2001.a) also found no relationship between patronage frequency and tips. Lynn and McCall (2000) obtained a correlation coefficient of 0.11 for the service-tip relationship, which is very small.

However, Lynn and Grassman (1990) suggest a strong relationship between patronage frequency and percent tip. I expect my results to conform to

Bodvarsson and Gibson's findings, since their sample is much larger and more generalized than other studies. Therefore the coefficient for patronage frequency is expected to be small and statistically insignificant.

- The variables associated with group size (**DineAlone** and **Dine10ppl**) detects whether people tip to establish reputation (if group size affects percent tip).

Lynn, Conlin and O'Donoghue (2003) found that percent tip increases with party size, which suggests people may be tipping to establish reputation. However, according to the study done by Bryant and Smith, there is a tendency for tip rate to decrease as party size increases. I expect the results of my research to be consistent with Lynn and other's results (negative coefficient for **DineAlone** and positive coefficient for **Dine10ppl**) since their study includes more observations.
- The purpose for adding in the dummy variables **ExcServ** and **PoorServ** is to see whether tipping works as an incentive (if service quality affects percent tip).

Bodvarsson and Gibson analyzed tipping with respect to both service quality and service quantity; they found that tipping heavily depends on service quantity but not on service quality. Lynn, Conlin and O'Donoghue (2003) offer contrary results. They found that tips tend to increase with the quality of service. Results from this study are expected to be consistent with the results

obtained by Lynn, Conlin and O'Donoghue, since service quantity was not taken into account in this research. Therefore a large coefficient with a positive sign is expected for ExcServ; a large coefficient with a negative sign is expected for PoorServ.

- **Inc>25000** is the dummy variable associated with server's income. The purpose of including this variable is to determine whether altruism is a motive behind tipping. This approach is an original contribution, since no previous study analyzed tipping behaviour with respect to server's income. I expect a negative and moderate size coefficient that is consistent with behavioural theories. Individuals are expected to be more altruistic towards the low-income servers and therefore are expected to tip more.
- **Bill\$100** is the dummy variable designed to capture the effect of cost on tipping. As mentioned in Chapter 2, Lynn, Conlin and O'Donoghue (2003) found that tips tend to decrease with bill size. Bodvarsson and Gibson (1994) found a positive relationship between bill size and tip. In another study by Lynn and McCall, the estimated coefficient for relationship between bill size and tip amount is 0.83. Results in this study are expected to conform to Bodvarsson and Gibson's results, with a negative and significant bill size coefficient. This is because Lynn and McCall also found similar results in a different study.

3.3 Concluding Remarks

The model presented in this chapter incorporates continuous and dummy variables that are important in this research. These variables account for the tippers' personal attributes and other external factors that may affect tips. The personal characteristics variables are Age, Male, AsianOrigin, OtherOrigin, Humanities, NatScience, SocScience, Commerce, OtherMajor, Graduate, Income, HousNPaid and TuitNPaid. Variables that represent other external factors are InfreqRest, DineAlone, Dine10ppl, ExcServ, PoorServ, Inc>25000 and Bill\$100. Definitions for these variables are provided in this chapter.

CHAPTER 4

Experiment

4.1 Background

Many behavioural economists have performed experiments in controlled environments such as laboratories and classrooms. There are also a number of previous survey studies on restaurant tipping behaviour. The majority of these surveys are conducted in casual environments, for instance, outside of restaurants.¹⁹ This research project attempts to combine the two traditional methods by performing surveys on restaurant tipping in a classroom setting.

The design of the experiment is crucial to its success. The design goal is to produce an experiment that would simulate individuals' tipping behaviour in reality. As Altman (2004) points out, "As Smith readily admits, the applicability of survey or laboratory research critically depends on how these tools are designed and whether their incentive structure reflects what would be faced in particular real-world scenarios". Similar to most other economic experiments and surveys, this experiment is not completely free of biases and errors. Special care was

²⁰ Scholars in the school of hotel administration conduct the majority of these surveys. Lynn, Conlin and O'Donoghue (2003) is one example.

taken to ensure that the experimental design did not have a major impact on the choices made by participants. I have attempted to minimize the biases and errors in my research through my experimental design.

4.2 Experimental Design

Ideas were taken from various economic experiments to design the surveying process. Articles on previous experiments were used as reference materials while planning survey procedures and preparing survey instructions.²⁰ I chose to run the experiment manually, as opposed to using computerized methods. Manual experiments have their advantages. According to Friedman and Cassar (2004), manual experiments are cheap and easy to get started, and easier to modify.²¹ Running the survey manually also offers more control over the sample population.

Once the survey procedure was developed, I applied for ethics approval from the University of Saskatchewan Advisory Committee on Ethics in Behavioural Science Research, which fully approved this project on September 17, 2004. Minor changes to the research design were approved on October 12, 2004. See Appendix 1 for the Behavioural Research Ethics Board approval documentation.

²⁰ The studies used for consulting purposes include Tversky and Kahneman (1981), Bradsley (2000) and Cookson (2000).

²¹ Friedman and Cassar (2004) have suggested many advantages for conducting economic experiments manually. They also offered contrast to the benefit of computerized experiments.

4.2.1 Recruitment Procedures

Once research approval was obtained, I proceeded to perform the experiment.

The first task was to recruit participants for the sample population from our population base of university students. There were three methods used in the recruitment process. First, posters about the research were placed on bulletin boards in the high traffic areas of the university. Furthermore, I had professors from various departments announce the research to their classes. I put posters into professors' mailboxes in departmental offices in the College of Arts and Science and my request for professors to publicize my research was contained in my posters. See Appendix 2 for a copy of the posters used. Shown on the posters are details of the research project and the researcher's contact information. Students who were interested were encouraged to contact me and arrange for a time to participate.

The last method used was approaching the students randomly to request their participation. About 70% of the students were recruited by this method. I decided the time and place for each session after arranging with the volunteers by telephone and e-mail. During the first three sessions of the experiment, I approached students who were strolling down the hallway and walking by the classroom, asking them if they would like to participate in a survey. They were informed about the nature of the survey, the topic and the approximate amount of time it would take to complete

the survey. About 50% of the students that I approached agreed to participate.

The majority of the students who refused to participate stated that they did not have the time to do so.

4.2.2 Surveying Process

The experiment took place in classrooms (Arts 100, 203 and 207) on the University of Saskatchewan campus. The classrooms are in the same building and have similar seating and furnishings. Four sessions were run on October 1st, October 27th, October 29th and November 8th, 2004. These sessions were conducted during different times of the day, to control from time of day biases in the sample. The first and second session took place in the afternoon at 2:30-3:30 and 12:30-1:30, while the third session took place in the morning at 10:40-11:30. The fourth session was run in the late afternoon from 4:30-5:30. Subjects were graduate and undergraduate students at the University of Saskatchewan. Eighty-one surveys were completed in the four sessions.

The experimental procedure was the same for all sessions. The participants were given a pencil, eraser and a copy of the questionnaire after they were seated. They were given the instructions to read over and a consent form to sign. I also instructed them to provide an estimate of their income to control for income variation across the sample population. They were instructed to ask clarifying questions

throughout the survey. When the questionnaires were turned in, I briefly looked over them to make sure all the fields were completed.

The first survey session that took place on October 1st also worked as a pilot session. Participants in the first session were recruited using all three recruitment methods. Twenty questionnaires were obtained during this session. During the session, some participants voiced their doubts about certain questions in the questionnaire. The bill size for the first three questions in Part C appeared to be ambiguous. To solve this problem, I gave the participants oral instructions to assume that the bill was twenty dollars.

A revised version of the questionnaire was used in the next three sessions. Revisions were made after learning about the minor flaws in the questionnaire used in the first session. Specifications about the bill size were added in to questions 1, 2 and 3 in Part C. The bill was assumed to be \$20, which is consistent with the oral instructions given during the first session. Changes to the questionnaire were sent to the ethics office, and approval was obtained on October 12th, 2004.

There was no advertisement for the second and third session that took place on October 27th and October 29th, 2004. Participants were recruited by the third method. I recruited the participants by simply asking the students who were walking down the hallway to participate in the survey. A total of fifty surveys were

completed during these two sessions. Participants for the fourth session were recruited through advertisements alone. Posters were placed on bulletin boards and announcements were put in professors' mailboxes. Students who were interested in the survey made phone calls to arrange for a time to participate. The different recruitment methods would not affect my sample because all the participants in this study are university students. I ensured that they were willing to participate and were not forced in any way. The different recruitment methods were justified later on in the study since similar results were obtained for all four sessions.

4.3 The Questionnaire

To develop the questionnaire, I studied the literature involving surveys on restaurant tipping. It provides countless ideas on the type of questions to be asked. Some published studies have attached a copy of the actual questionnaire used during the surveying process.²² Those questionnaires were used as guidelines to developing the questionnaire for this research project. I also consulted my supervisor for his recommendations. See Appendix 2 for the first and second version of the questionnaire used. The questions focus on the potential motives discussed in previous studies; not all aspects of tipping are pursued in this study.

²² Many of Michael Lynn's studies on restaurant tipping provide the actual questionnaire used during his surveys; one of them is Conlin, Lynn and O'Donoghue (2003).

My potential survey group was not thought to be sufficient to explore all aspects either.

The first part of the survey asks the participants to provide personal information that includes age, sex, place of origin, major, year of study and after-tax income. The purpose of collecting these data is to analyze the relationship between these personal characteristics and tipping behaviour. In addition, participants were asked if they pay their own tuition and housing expense. My model takes into account these income-related factors.

To investigate the effect of patronage frequency on the percent tipped, two sets of identical questions were asked. Part A and Part B contain two sets of identical questions with varying levels of patronage frequency as a priori. Questions in Part A involve tipping in a frequented restaurant, while questions in Part B involve tipping in a restaurant the respondent will never visit again.

In both Part A and Part B, questions 1, 2 and 3 investigate the effect of group size and service quality on percent tip. Individuals are assumed to be dining alone, in a group of two and in a group of ten in these three questions. Each of these questions is further broken down into three different components. The tipper receives excellent, average and poor service for each component. Participants are asked how much they will tip in these situations.

Server's income is manipulated to determine whether altruism is a motive behind tipping. Question 4 in both Part A and Part B is designed to detect the effect of server's income on percent tip. Servers are portrayed as both high and low-income earners in the question to detect the effect of server's financial status on tipping. This approach is an original contribution, since no previous study analyzed tipping behaviour with respect to server's income. This is to ascertain the extent to which tipping is related to sympathy (related to the warm-glow effect) which the tipper might have to the server.

Question 5 in Part A and Part B investigates the effect of cost on tipping. The purpose of this question is to see if tipping behaviour changes with a change in bill size from 10 dollars to 100 dollars.

I would also like to find out if people are cognitively constrained when calculating tips. Part C requires participants to provide tip amounts in dollars instead of percentages. One can see if individuals accurately expressed their desired percent tip in dollars by comparing the dollar tips to the percent tips for similar questions in Part A. This is also an original contribution in the area of restaurant tipping.

Since the number of questions that can be asked is limited, not all aspects of tipping are explored. The questionnaire focuses on the questions asked in previous

studies, so I can compare my results to these studies. The type and quality of the restaurant is ignored, although it may have an effect on tipping. Whether the bill in a large group is pooled or separate may also have effect on tipping. But this has not raised problems in previous studies; therefore should not be a problem here.

Familiarity with the server and the method of payment may also affect tipping.

Previous studies have not focused on these issues; therefore they are not included in the questionnaire. Implementation of the survey does not allow me to ask a large number of questions, so I need to economize and focus on what is important in this study.

The majority of the previous studies on restaurant tipping includes statistical analysis on the data. Scholars typically calculate the mean and variance for the tips. Often they also calculate the mean for other variables (i.e. group size, bill size) and perform significance tests. Sometimes they also test for correlation between variables. Similar statistical procedures will be done in this research.

4.4 Sample Size

Determining the sample size is crucial to the success of the research. To restrict the size of sampling error in the research, statistical methods were used to calculate the sample size. Using data from the first session, I have determined the

desired confidence interval and the minimum sample size required in estimating the mean. I have chosen the tippers dining in a frequented restaurant in groups of 2 people who receive average service as the base group.

Confidence Interval

$$\bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}} \leq \mu \leq \bar{x} + z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$9.45 - 1.96 \frac{4.57}{\sqrt{20}} \leq \mu \leq 9.45 + 1.96 \frac{4.57}{\sqrt{20}}$$

$$7.45 \leq \mu \leq 11.45$$

$\bar{x} = 9.45$ = mean tip for base group

$\alpha = 0.05$ = 95% confidence interval

$z_{\alpha/2} = 1.96$ = Z-value for 95% confidence interval

$\sigma = 4.57$ = standard deviation for the base group

$n = 20$ = sample size for the first session

We can be confident that intervals obtained using this procedure are likely to contain μ 95% of the time. For ninety-five out of a hundred samples of size $n=20$, the true population mean μ will be included in the intervals 7.45~11.45.

This is a reasonable confidence interval.

Sample Size

$$n = \frac{z_{\alpha/2}^2 \sigma^2}{D^2}$$

$$n = \frac{1.96^2 (4.57^2)}{1^2}$$

$$n = 80.23$$

$\alpha = 0.05$ = 95% confidence interval

$z_{\alpha/2} = 1.96 = Z\text{-value for } 95\% \text{ confidence interval}$

$\sigma = 4.57 = \text{standard deviation for the base group}$

$D = 1 = \text{largest allowable sampling error between estimated and true values of the population parameter}$

There are 81 questionnaires completed for this research, which is close to the calculated desired sample size of 80.23. The sample size chosen is also larger than many of the previous studies. In the study by Lynn and Gregor (2001) on hotel bellmen, 50 observations were obtained. Lynn and Simons (2000) surveyed male and female servers in a restaurant to obtain average tip earnings. In this study, only 51 questionnaires were completed. The sample size selected for this research is larger than these studies.

A meaningful study requires the sample to contain a certain number of observations of each type. As Friedman and Cassar points out, laboratory work and some theory suggest that as few as three people of each type suffice for many strong economic institutions and six to eight people suffice for most games.²³ Similarly, as Friedman and Sunder (1994) commented, “most studies suggest that two or three subjects in identical situation (i.e., “clones”) are sufficient for attaining competitive results in laboratory markets”. The data obtained in my survey fulfills this

²³ Sample size is a controversial topic in experimental economics. Various sources suggest different numbers for a sufficient sample size, Friedman and Cassar (2004) discusses the topic.

requirement, since we have at least three people for each type of personal characteristics.

4.5 Sources of Error and Biases

4.5.1 Design Biases

Some of the major biases arise as a result of the experimental setting. Classroom settings offers more control and reduce “noise” that may affect individual’s behaviour, as opposed to conducting surveys outside of restaurants. Although conducting surveys in classrooms offers more control and stability, there are also some downsides to it. According to Brandts (2000), “given the rather abstract character of this environment, there is a natural concern that behaviour may depend on specific features of the experimental procedures that do not correspond to any issues of intrinsic interest”.²⁴ Individuals’ responses in a classroom may be different than in restaurants; participants may be unable to accurately imitate how they would tip in actual circumstances. Brandts further points out that a number of experiments show that subtle changes in the environment can have powerful effects on the reasoning process and on behaviour. The change of setting from restaurants (as in previous studies on restaurant tipping) to classrooms could offer rather

²⁴ Jordi Brandts, “Hot vs. Cold: Sequential Responses and Preferences Stability in Experimental Games” (Experimental Economics, 2000) p.227

surprising results. According to Altman (2004), “Smith finds that simulated economies in the laboratory tend to be efficient, and that economic agents tend to be rational in the sense of behaving (making choices) as predicted by standard economic theory”.²⁵ Therefore, consistent results are expected for this research.

There are two other possible sources of error due to the experimental design. Firstly, one can never rule out the possibility that participants may lie about their behaviour. This is a concern to all experimental studies, especially in surveys. This was taken into account while designing the surveying process. I have implemented procedures in attempt to reduce the participants’ incentive to lie. The survey was anonymous; it does not require participants to identify themselves. Individuals are not motivated to lie since their identity is protected. They can express their true preferences free of any social pressure. Secondly, participants’ responses toward hypothetical questions may be different than their actual behaviour. There may be a difference between one’s true preference and his or her expressed preference. According to Brandts (2000), some social scientists find it intuitive that people will have a stronger emotional reaction to a real action than to a hypothetical one. Participants themselves may not be aware of such divergence. One possible

²⁵ Morris Altman, “The Nobel Prize in Behavioral and Experimental Economics: a Contextual and Critical Appraisal of the Contributions of Daniel Kahneman and Vernon Smith” (Review of Political Economy, 2004) p.4

explanation for the divergence lies in the cost of tipping. There is no actual cost involved in the survey; individuals can choose any levels of tip without being bounded by their choices. But in reality, there are monetary and emotional costs associated with tipping and not tipping. Participants may respond in ways that are differently than in real scenarios. This is a concern to all social scientists; this research is not special in this case.

4.5.2 Cognitive Biases

Individuals can be biased by their cognitive abilities. As suggested by Simon, there are cognitive limitations to human capacity to process information.²⁶ Everyone has a different level of knowledge and computational capacity, the variance is even more apparent with people who are from different backgrounds. Individuals' ability to process information in English may heavily depend on their ethnicity. Participants may not fully understand the questions being asked when English is not their first language. Cognitive biases are minimized by a questionnaire design that is simple and easy to follow. The questions do not contain any vocabularies that an average person would not understand. The subjects in this survey are university students; they are assumed to be a group with higher cognitive abilities. They are also expected to have a certain understanding of the English

²⁶ See Simon's article "Bounded Rationality" for discussions on human cognitive limitations and other related topics.

language, even when they are from a different ethnic background. Therefore, cognitive biases should not have significant impacts on the participants' choices.

CHAPTER 5

Data and Analysis

In this chapter, I present an in-depth analysis of the data. The first section includes a descriptive summary of the data and interpretations of the results. I also compare my results with previous empirical studies. The second section contains an econometric analysis. In the full model, three regressions are run on the data using computer software. In addition, I analyze the scale effect of the estimated coefficients. The size effects of the coefficients are as important as the sign and significance. If the coefficient for a variable was not important in size, it would not have important effect even when the variable is significant. Previous studies often focus on the significance and signs of the coefficients; this study contributes by analyzing in terms of size as well. The data are then analyzed with a two-step procedure as an alternative approach. There are further discussions on regression results and their implications in the last part of this chapter. I attempt to verify the hypotheses outlined in Chapter 2 with my results.

5.1 Descriptive Summary of Data

Among the 81 respondents, 38 (46.9%) are male and 43 (53.1%) are female.

The average respondent's age is 22 years, with standard deviation of 2.84.

Respondents' ages are clustered around the mean, since the majority of university students are from 18-25 years old. The average respondent in this study is younger than in Lynn, Conlin and O'Donoghue (2003).²⁷ There are limitations to the study, partly because the subjects are university students. For instance, the range of age and income are limited in the study. Individuals from Canada make up 67.9% of all respondents; 28.4% of the respondents are from Asia; only 3.7% are from places other than Canada and Asia. Economics (23.5%) and Commerce (21.0%) students make up approximately 45% of the sample population. There are ten to twelve students each enrolled in humanities, natural sciences, social sciences and other programs. Undergraduate students make up 88.9% of the respondents; only 11.1% of the respondents are graduate students. The average respondents' monthly income is \$708, with standard deviation of \$574. Some of the respondents have much lower income, but parts of their expenses are being paid for. This can be an explanation for the significant variance in respondents' income. Sixty-nine percent of the respondents have their housing expense paid for by a third party (i.e. parents

²⁷ Lynn, Conlin and O'Donoghue (2003) classified the apparent age of the tipper into four categories: (1) teenage, (2) young adult, (3) middle aged and (4) elderly. Average age was 2.68, between young adult and middle aged. The average age of 22 in this study falls in the category of young adult, thus is younger than the average tipper in Lynn's study.

and friends), while 62 percent have their tuition paid for by a third party.

Average tips in this study are lower than the “norm” for North America.²⁸

Table 6 shows the mean and median tips in this study. The average tip is 10.2% in a typical case where a tipper dines at a frequented restaurant, in a group of 2 people and is provided with average service. This is much lower than the 16.1% reported by Bryant and Smith (1995) and the 17.6% reported by Lynn, Conlin and O’Donoghue (2003). The highest mean tip in this study is 14.7% (tipper in a group of 2, in a frequent restaurant and was given excellent service), which is still slightly lower than other empirical studies. In general, individuals tend to tip slightly less in a restaurant they will never go to again (Figure 2). According to Table 6, the differences in tipping in frequented and not frequented restaurants are less than 2%. The difference is not large from the tipper’s perspective, but it may be large to the servers that work at a restaurant. Service quality seems to be the major determinant of tips. There is a significant decrease in tip percentages when service quality drops from excellent to poor. Tip percentages drop by approximately 10 percentage points for all group sizes and patronage frequencies. For example, when dining in a group of 2 in a frequented restaurant, mean percent tip drops from 14.7% to 4.1%. Only 26% of the respondents will tip no matter the circumstances. In other words,

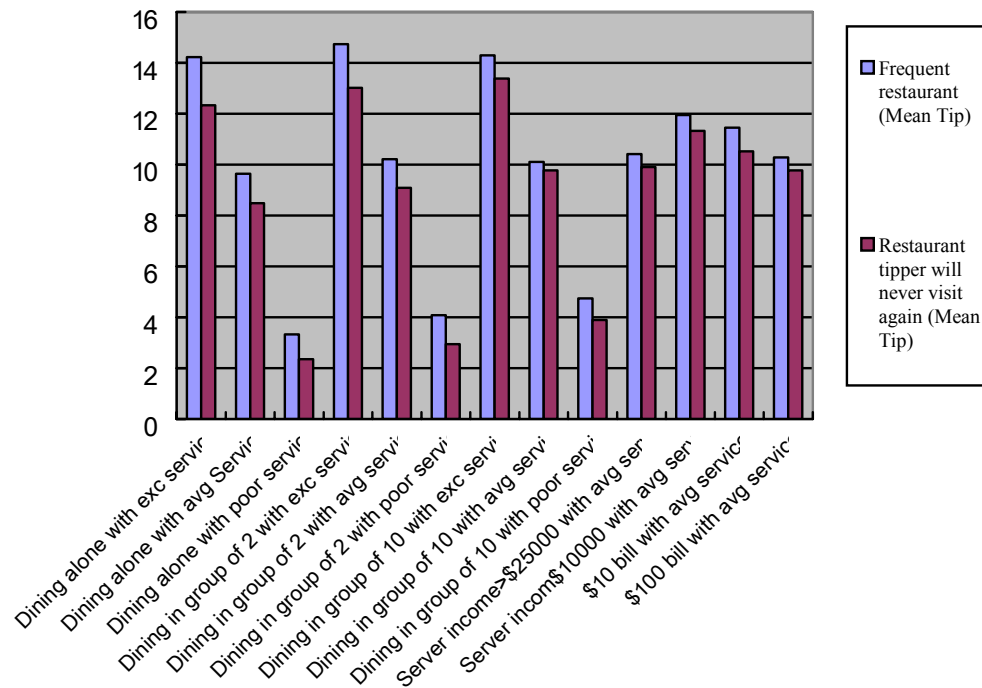
²⁸ The “norm” in North America is 15-20% as stated in previous chapters; all mean tips in this study are lower than 15%.

74% of people will not tip at all when service quality is poor. For those individuals who tip even in spite of poor service there is a dramatic drop in percent tip from 16.9% to 10.1% when service quality drops from excellent to poor (group of 2, frequent restaurant). The effect of server's income and bill size on tipping seems to be negligible; there is only about 1 percentage point difference in both scenarios (10.4% for high-income server and 12.0% for low-income server in a frequented restaurant).

Table 6: Summary of Tip Statistics

	Frequent Restaurant				Restaurant Tipper Will Never Visit Again			
	For All People (81)		For People Who Tip >0 in all cases (21)	For People Who Tip 0 in some cases (60)	For All People (81)		For People Who Tip >0 in all cases (21)	For People Who Tip 0 in some cases (60)
	Mean Tip (s. d.)	Median Tip	Mean Tip	Mean Tip	Mean Tip (s. d.)	Median Tip	Mean Tip	Mean Tip
Dining alone with excellent service	14.23 (5.03)	15	15.95	13.63	12.33 (5.35)	10	13.29	12
Dining alone with average service	9.64 (4.31)	10	12	8.82	8.48 (4.70)	10	11.33	7.48
Dining alone with poor service	3.33 (4.90)	0	8.95	1.37	2.35 (4.46)	0	8.33	0.25
Dining in a group of 2 with excellent service	14.73 (5.36)	15	16.90	13.97	13.02 (5.00)	12	14.71	12.43
Dining in a group of 2 with average service	10.21 (4.72)	10	13.19	9.17	9.09 (4.29)	10	12	8.07
Dining in a group of 2 with poor service	4.08 (5.40)	0	10.05	1.99	2.95 (4.74)	0	9.19	0.77
Dining in a group of 10 with excellent service	14.30 (7.58)	15	18.10	12.98	13.39 (6.68)	12	16.90	12.16
Dining in a group of 10 with average service	10.11 (5.87)	10	13.81	8.82	9.78 (5.38)	10	12.76	8.73
Dining in a group of 10 with poor service	4.75 (6.06)	5	11.10	2.53	3.89 (5.98)	0	10.24	1.67
Server income >\$25000 with average service	10.41 (4.72)	10	12.71	9.6	9.91 (4.90)	10	12.62	8.97
Server income <\$10000 with average service	11.95 (5.87)	10	13.90	11.27	11.33 (5.82)	10	13.90	10.43
\$10 bill with average service	11.46 (5.19)	10	13.10	10.88	10.52 (5.71)	10	12.67	9.77
\$100 bill with average service	10.28 (5.25)	10	13.90	9.02	9.78 (5.05)	10	13.10	8.63

Figure 2: Mean Tip in Both Frequent and Infrequent Restaurants



There is a large difference in mean tip for those people who choose to tip and not to tip when service quality is poor (refer to Table 6.1). Mean tip for those who choose to tip anyhow (13.2% under average service condition) is 4 percentage points higher than those who do not always tip (9.2%). Given poor service, 26% of the sample population still tips a mean tip of about 10%. The service quality effect on the tip is much larger for the people who tip nothing when poor service is provided. There is a more dramatic decline in tip percentages when service drops from excellent to poor.

Table 6.1 People Who Always Tip vs. People Who Do Not Tip When Service Is Poor

	Mean Tip for people whose Tip>0 with poor service (26%, 21 respondents)	Mean Tip for people whose Tip=0 with poor service (74%, 60 respondents)
Poor service Condition (group of 2, frequent restaurant)	10.1%	2%
Average Service Condition (group of 2, frequent restaurant)	13.2%	9.2%
Excellent Service Condition (group of 2, frequent restaurant)	16.9%	14%

5.1.1 Summary of Responses in Dollar Amounts

It is interesting to see whether respondents are capable of calculating tips.

Respondents are asked to provide both dollar tips and percent tips. Individuals tend to think of tips as percentage of a bill in their minds. Percent tips are assumed to be an individual's expressed preference; dollar tips are assumed to be the actual tip the individual gives. Data in both forms are compared against each other to find out if there is a significant difference. This is to verify whether individuals are biased by cognitive constraints. According to Simon (2002.b), there are cognitive constraints on everyone, even on intelligent people. To claim that individuals are cognitively limited does not mean that individuals are stupid; they may be satisficing or using heuristics as shortcuts.

On average, mean dollar tips are higher than their corresponding percent tips.

Table 7 lists the mean dollar tips and their percentage conversions. In most cases, mean dollar tips are 3-5 percentage points higher than mean percent tips (Figure 3). The most divergence occurs when the tipper is dining in a group of 10 and is provided with average service. The respondents' average dollar tip was \$3.02 (15.1%), which is 5 percentage points higher than the corresponding percent tip (10.1%). However, when the bill is \$100 and service is average, mean dollar tip and mean percent tip converges. Difference between the mean dollar tip (9.9%) and the mean percent tip (10.3%) is less than half a percentage point. A possible explanation is that \$100 bills are easier to calculate than \$10 bills. For instance, individuals may be able to calculate 15% of a \$100 bill, but calculating 15% of a \$10 bill may be more difficult. The mean dollar tip for a \$10 bill is 16.1%, while the mean dollar tip for a \$100 bill is only 9.9%. This shows that the cost of tipping may influence on tip amounts. Results of this study suggest that individuals are cognitively biased. They may use heuristics to determine tip amount when the cost is small (i.e. \$10 bill) and use percentage calculations when the cost of using heuristics is high.

There is substantial difference between individuals' expressed preference and the actual tip amounts. A possible explanation for this phenomenon is that individuals are either not capable of doing complex calculations, or they are too lazy

to do so. Individuals may also be less concerned with the cost of tipping when tip is small, so they will use heuristics because it is easy. Individuals may switch to using calculations when the cost is higher (i.e. in the case of \$100 bill). Another possible explanation is that individuals are concerned with the absolute value of the tip. They may set upper and lower limits to the amount of the tip that they consider reasonable. This study does not provide a satisfying conclusion as to whether individuals are cognitively constrained. This may be a very complex issue that needs further investigation that is out of the scope of this study.

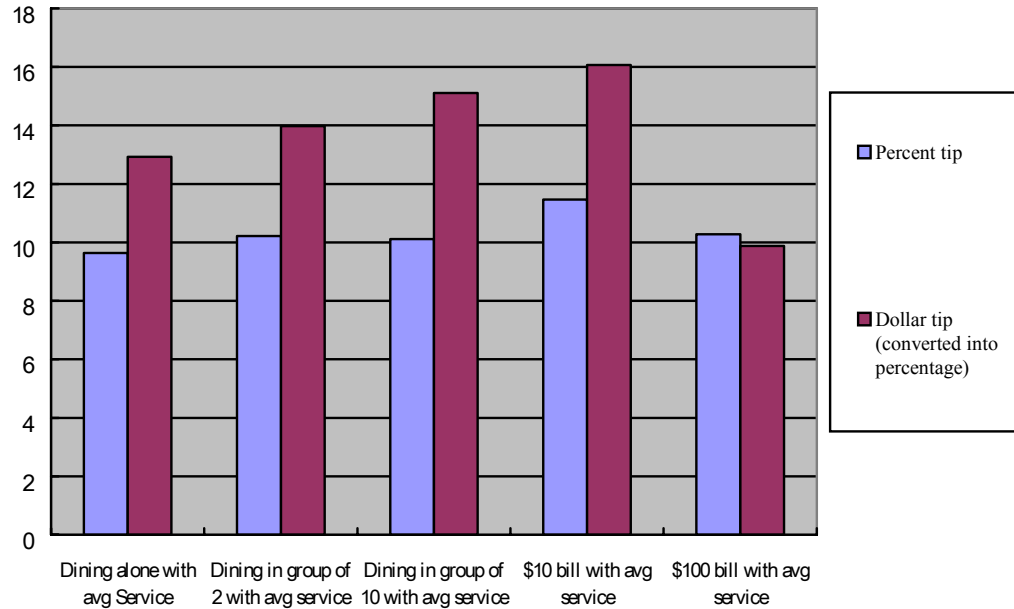
Table 7: Summary of Individuals' Responses in Dollar Tips (\$)

	Mean Tip (%*)	Median Tip (%*)	Variance (%**)	s. d. (%**)
Dining alone with average service (\$20 bill)	2.58 (12.92)	2 (10)	0.97 (24.22)	0.98 (4.92)
Dining in a group of 2 with average service (\$20 bill)	2.79 (13.97)	2 (10)	1.87 (46.75)	1.37 (6.84)
Dining in a group of 10 with average service (\$20 bill)	3.02 (15.11)	2 (10)	7.43 (185.71)	2.73 (13.63)
\$10 bill with average service	1.61 (16.06)	1(10)	1.75 (174.88)	1.32 (13.22)
\$100 bill with average service	9.88 (9.88)	10 (10)	19.73 (19.73)	4.44 (4.44)

* Tip amount converted into percentage given the bill size

** Variance and standard deviation calculated with percent-tip conversion

Figure 3: Percent Tip vs. Dollar Tip In a Frequent Restaurant



5.2 Econometric Analysis: Full Tipping Model

In this section, I perform the econometric analysis on the data. Since there are 31 tipping-related questions in each survey, the completion of 81 surveys yields a total of 2511 observations. The data are divided into three parts because of the way the questionnaire was constructed. Three separate Ordinary Least Squares (OLS) regressions were run using E-views. The full model contains all the observations in the data (including all the zeros), therefore it accounts for the fact that some tippers will choose to tip nothing under certain circumstances.

My model is based on regression results given by Equation 1, since it contains the most observations. Equation 2 and Equation 3 are only used to obtain estimated

coefficients for the server's income variable and the bill size variable. Equations 1, 2 and 3 are used to explore different motives of tipping behaviour and they portray tip percentages as being determined by different factors. Equation 1 is also the best since it has the highest R^2 (0.479) and adjusted R^2 value (0.472). I did not choose to take out any of the variables in Equation 1 because all the parameters have a t-statistics value greater than 1 (or smaller than -1). Eliminating any variable will result in a model with a lower adjusted R^2 . I used the adjusted R^2 as a rule when choosing the equation because it is a widely used criterion. It also accounts for the fewer degrees of freedom associated with the addition of each variable. I also check each coefficient's sign and size, judging if it is reasonable, before I proceed to examining the significance of each variable. Results of all three regressions are shown in Table 8. (See Appendix 3 for complete regression results)

Multicollinearity between the income-related variables (Income, HousNPaid and TuitNPaid) is not important because two of the three variables are largely significant.

Table 8: Regression Results (Full Model)

Equation 1 (1458 observations) Equation 2 (324 observations) Equation 3 (324 observations)

Variable	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.
Constant	6.850	1.26	5.45	0.000	13.134	2.38	5.51	0.000	8.399	2.64	3.18	0.002
Age	0.187	0.06	3.35	0.001	0.127	0.11	1.18	0.238	0.277	0.12	2.32	0.021
Male	0.554	0.28	1.97	0.049	0.095	0.54	0.17	0.861	0.088	0.60	0.15	0.884
AsianOrigin	-3.350	0.43	-7.86	0.000	-5.803	0.82	-7.07	0.000	-5.377	0.91	-5.91	0.000
OtherOrigin	-7.733	0.91	-8.53	0.000	-10.780	1.75	-6.18	0.000	-10.420	1.94	-5.38	0.000
Humanities	-3.063	0.53	-5.73	0.000	-5.388	1.03	-5.23	0.000	-4.230	1.14	-3.70	0.000
NatScience	-1.322	0.51	-2.60	0.009	-5.224	0.98	-5.34	0.000	-3.738	1.08	-3.45	0.001
SocScience	-1.107	0.48	-2.29	0.022	-3.861	0.93	-4.15	0.000	-1.176	1.03	-1.14	0.255
Commerce	0.515	0.45	1.13	0.260	-2.369	0.88	-2.69	0.007	-0.441	0.98	-0.45	0.651
OtherMajor	-1.116	0.54	-2.05	0.040	-4.509	1.05	-4.30	0.000	-2.318	1.16	-1.99	0.047
Graduate	1.149	0.48	2.40	0.017	0.581	0.92	0.63	0.529	-0.455	1.02	-0.44	0.657
Income	0.002	0.00	7.80	0.000	0.003	0.00	5.67	0.000	0.002	0.00	3.97	0.000
HousNPaid	0.447	0.34	1.30	0.193	1.213	0.66	1.83	0.068	0.219	0.73	0.30	0.766
TuitNPaid	-1.570	0.33	-4.72	0.000	-3.273	0.64	-5.12	0.000	-2.825	0.71	-3.98	0.000
InfreqRest	-1.124	0.26	-4.33	0.000	-0.556	0.50	-1.11	0.267	-0.719	0.55	-1.30	0.195
DineAlone	-0.618	0.32	-1.95	0.052								
Dine10ppl	0.357	0.32	1.12	0.261								
ExcServ	4.117	0.32	12.96	0.000								
PoorServ	-5.993	0.32	-18.86	0.000								
Inc>25000					-1.481	0.50	-2.97	0.003				
Bill\$100									-0.954	0.55	-1.72	0.086

The base group consists of undergraduate female respondents from Canada majoring in economics with housing and tuition paid for by a third party. They are assumed to be in a frequented restaurant, dining in a group of 2, provided with average service, given a \$10 bill and served by a server whose annual income was less than \$10000. According to my results (Equation 1), the base group would tip:

$$\text{Mean Tip} = \alpha + \beta(\text{Mean Age}) + \gamma(\text{Mean Income})$$

$$= 6.850 + 0.187(21.778) + 0.002(707.84)$$

$$= 12.34\%$$

Therefore a typical person in the base group of this study would tip 12.3% under the specific circumstances outlined above.

5.2.1 Interpretations

Since the dependent variable is the percent tip, the coefficients are interpreted as deviations around the mean. For example, a male coefficient of 0.554 implies male tippers tip 0.554% extra when compared to females. Therefore if a female tips 10%, then a male will tip 10.554%. A coefficient that is smaller than 10% of the mean tip (1.23) is said to be not important, while a coefficient that is larger than 10% of the mean tip is said to be important. A marginal change of 1.23% is assumed to be important from both the server's and the tipper's perspective.

I choose 10% as a benchmark for economic importance because it seems appropriate. I tried using 5% as a benchmark but it seems to be too small from the tipper's perspective. A 5% change is too small to have an economic importance, even when it is statistically significant. Therefore 10% seems to be a reasonable standard; it is easier to interpret and less perplexing than other numbers. Such a change is also economically important from both the server's and the tipper's perspective.

A coefficient is said to have important size effect when it is larger than 10% of the mean tip. If a tipper is given a \$20 bill, a 10% change in mean tips is about 25 cents. The amount may seem small, but it can add up to a large amount if the tipper dines out frequently. Since a large number of tables are served during a shift, a 10% change in tips is also important from the server's perspective. If a server receives fifty dollars in tips per night, a 10% change is five dollars, which is about the minimum hourly wage of the server. In general, a 10% change in a variable would be considered as an important and a change smaller than 10% seems negligible. For instance, if a person earns \$2000 per month and his or her income rises by 10% (\$200), it would be considered as an important change. But if that person's income only rises by 5% (\$100), it is not so important economically. Therefore, a 10% change is considered economically important because it is large enough to have an obvious impact on the dependent variable.

- Age is positively related to Tip and is statistically significant at the 95% significance level. This implies tip percentages tend to increase with the tipper's age. This is contrary to the results reported by Lynn, Conlin and O'Donoghue (2003), which suggest a negative relationship. A possible explanation is that Lynn's study has a much wider age range. Size effect of the coefficient can be important given a large age range.

- The coefficient of Male is positive and significant. This is contrary to the study by Bryant and Smith (1995), which suggests that women tip more than men. However, the positive relationship is consistent with the findings by Lynn and McCall (2000), which states that male tend to tip slightly more than female. Size effect of the coefficient is not important.²⁹
- Coefficients for AsianOrigin and OtherOrigin both have negative signs and are statistically significant. This implies that Canadians tend to tip more than people from other backgrounds. This result is consistent with the study by Lynn and Haysbert (2003), which reports that Whites (the majority of Canadians are Caucasians) are more committed to leaving larger tips than other ethnic groups.³⁰ Size effects of both coefficients are very important.
- The coefficients for the variables Humanities, NatScience, SocScience and OtherMajor all bear negative signs. They are also statistically significant. Commerce is the only variable positively related to Tip in this category, but it is insignificant. Economics and Commerce students may tip more because they have better knowledge on tipping. However, this is contrary to Frank (2005)'s

²⁹ The difference between male and female tipping behaviour may be due to biological differences, the different needs to impress the opposite sex, or sexual discrimination.

³⁰ It is also possible that individuals from different ethnic groups are tipping differently because of cultural characteristics or racial discrimination.

expectation of a positive relationship.³¹ Among these coefficients, Humanities and NatScience are the only two with important size effects.

- The Graduate variable is positively related to Tip and is statistically significant at the 95% significance level. A possible explanation for graduate students to tip more is their higher expected future income. Size effect of the coefficient is not important.
- Income is positively related to tipping and is statistically significant. Size effect of the coefficient can be important given a larger range of income. This is consistent with my expectations.
- HousNPaid and TuitNPaid are income-related variables. The HousNPaid coefficient is positive and insignificant, but the TuitNPaid coefficient is negative and significant. The sign of the TuitNPaid coefficient is consistent with my expectations, but the HousNPaid coefficient is not. This not a major problem since HousNPaid is insignificant. The size effect of TuitNPaid is important, while the size effect of HousNPaid is not.
- The InfreqRest coefficient is negative and statistically significant. This is consistent with the study by Lynn and Grassman (1990), which states that tip amounts increase with patronage frequency. This result is contrary to my

³¹ Frank (2005) argues that studies have found that repeated exposure to the self-interest model makes selfish behavior more likely. Therefore economists are more selfish than others.

expectations as well as the finding of Bodvarsson and Gibson (1994), of a weak frequency-tip relationship. Size effect of this coefficient is not important.

- The DineAlone coefficient is negative and the Dine10ppl coefficient is positive; this is consistent with my expectations. However, Dine10ppl is insignificant at the 95% significance level. This implies that Tip may increase with group size.

Lynn, Conlin and O'Donoghue (2003) have similar findings. On the other hand, this is contrary to Bryant and Smith's finding of a decreasing trend in tip rate as the size of the party increases. Size effects of both coefficients are not important.

- The ExcServ coefficient is positive and the PoorServ coefficient is negative. They are both statistically significant. This suggests that tip percentage increases with service quality. This conforms to my expectations and the study by Lynn, Conlin and O'Donoghue (2003). This is contrary to Lynn and McCall (2000), which concluded that service effect on tips is minimal. This result is also different than that obtained by Bodvarsson and Gibson (1994), since they argue service quantity (not quality) influences tipping. Both of these coefficients have very important size effect.

- Inc>25000 is negatively related to Tip and is statistically significant. This implies that tip percentages tend to decrease with server's income and is

consistent with my expectations. Size effect of this coefficient is important.

- The coefficient of Bill\$100 is negative and insignificant. This suggests that tip percentage may decrease with bill size. This is consistent with Lynn and others' results.⁶⁰ However, this is contrary to my expectations since the coefficient is insignificant at the 95% significance level. This coefficient does not have an important size effect.

5.2.2 Elasticity

It is more meaningful to discuss the coefficients for continuous variables in terms of elasticity. There is a limited range of age and income because the subjects of this study are university students. There would definitely be a larger range in the real world. The Age coefficient is 0.19. A one-year increase in the age of an individual will result in a 0.19% increase in percent tip. The age elasticity of tipping is calculated as follows:

$$\begin{aligned}\text{Elasticity} &= (d\text{Tip}/d\text{Age}) * (\text{Age}/\text{Tip}) \\ &= \text{Age Coefficient} * (\text{Mean Age}/\text{Mean Tip}) \\ &= 0.187 * (21.778/8.926)\end{aligned}$$

⁶⁰ Lynn, Conlin and O'Donoghue (2003) found a negative relationship between bill size and tip. Bryant and Smith (1995), as well as Bodvarsson and Gibson (1994) found that tip percent depends on bill size.

$$= 0.456$$

An elasticity of 0.46 implies a 10% increase in mean age (2.18 years) will result in a 4.6% increase in mean tip (0.41 percentage points). Tipping is inelastic with respect to age of the tipper. Effect of age on tips is not very large, which is consistent with my expectation of a small age effect. Given a larger age range, the age effect can be large.

The Income coefficient is 0.002. A \$1 increase in an individual's income causes a 0.002% increase in tip percentage. A more expressive interpretation is that a \$1000 increase in an individual's income will result in a 2% increase in tipping.

The income elasticity of tipping is:

$$\text{Elasticity} = (d\text{Tip}/d\text{Income}) * (\text{Income}/\text{Tip})$$

$$= \text{Income Coefficient} * (\text{Mean Income}/\text{Mean Tip})$$

$$= 0.002 * (707.840/8.926)$$

$$= 0.159$$

This implies that a 100% increase in mean income (\$707.8) will result in a 16% increase in mean tip (1.4 percentage points). Tipping is very inelastic with respect to income of the tipper. Effect of an individual's income on tipping is very small, given the limited range of income in this study. However, income effect can be large if we can extrapolate to a larger range of income.

5.2.3 Scale Effect

In the following section, I discuss the size of the coefficients in their absolute values:

- The **Male** coefficient is 0.55. This implies that a male tipper tips about half a percentage points more than a female tipper. Size of the coefficient is not important, which is consistent with my expectations.
- **AsianOrigin** and **OtherOrigin** are two of the variables with very important size effects (coefficients are -3.35 and -7.73 respectively). Both of them are dummy variables, therefore a person from Asia tip about 3 percentage points less than a person from Canada. Someone from other origins tips almost 8 percentage points less than someone from Canada. This is a substantial difference in tip percentages, which is consistent with my expectations for the social norms theory.
- The **Humanities** coefficient is -3.06, this means someone majoring in Humanities tend to tip 3 percentage points less than someone in Economics. The **NatScience** coefficient (-1.32), which has important size effect. The **SocScience** coefficient (-1.11), **Commerce** coefficient (0.52) and **OtherMajor** coefficient (-1.12) are not large. Students with a natural science, social science and other major tip about one percentage point less than an Economics student.

A commerce student tips half a percentage point more than an Economics student. However, I am not confident about the relationship between Commerce and Tip because the variable is insignificant. These results are consistent with my expectation, but contrary to Frank's study.

- The **Graduate** coefficient is 1.15. A graduate student tips about 1 percentage point more than an undergraduate student. The size of this coefficient is not important, which is consistent with my expectation.
- The **HousNPaid** and **TuitNPaid** coefficients are 0.45 and -1.57 respectively. An individual who has his or her tuition paid for tip 1.5 percentage point more than someone who pays for his or her own tuition. Someone who has his or her housing expense paid for tends to tip half a percentage point less than someone who does not. This is a strange conclusion because the HousNPaid variable is insignificant. I am not confident about the relationship between HousNPaid and Tip.
- The **InfreqRest** coefficient is estimated as -1.12. Tippers dining in a frequented restaurant tip about one percentage point more than in a restaurant that they will never go to again. Size of the coefficient is not important, which conforms to my expectations of a small coefficient.
- Neither **DineAlone** nor **Dine10ppl** have important size effect (-0.62 and 0.36).

A tipper who is dining alone tips 0.6 percentage point less than someone dining in a group of 2. Someone who dines in a group of 10 tends to tip less than half a percentage point more than someone dining in a group of 2. However, the Dine10ppl variable is insignificant. This study does not provide conclusive results on the relationship between a group size of 10 and tipping.

- **ExcServ** and **PoorServ** both have very important size effects (4.12 and -5.99); they are also consistent with my expectations. These variables are also dummy variables. When provided with excellent service, tippers leave about 4 percentage points more tips than with average service. If provided with poor service, tippers tend to tip 6 percentage points less than with average service. This is an important difference since it is nearly half of the average tip.
- The **Inc>25000** coefficient is estimated as -1.48. Someone who is served by a server with annual income over \$25000 tips one and a half percentage point less than someone who is served by a low-income server (annual income less than \$10000). Size of the coefficient is important, but the tippers are not as sensitive to the servers' income as expected.
- The **Bill\$100** coefficient is -0.95, it does not have important size effect. This implies tips are about 1 percentage point higher for \$10 bills than \$100 bills. This variable is insignificant; therefore the relationship stated above contains

large margin of error.

5.3 Econometric Analysis: Two-Step Procedure

There is an alternative approach to analyzing tipping other than the full model.

Tipping can be viewed as a two-step process. First, a person has to decide upon whether to tip or not. If he or she decides not to tip, no tip is left. If the decision is to tip, then the person has to decide how much to tip. This approach allows us to gain more insights into tipping behaviour in terms of the decision to tip and the amount of tips given. The analysis can be separated into two parts. The first part is to examine the probability of tipping, which can be done through a linear probability model. The second part is to analyze the level of tipping conditional on the fact that tips will be given. This part of the analysis is the conditional model. This approach sheds more light on tipping behaviour and allows us to decompose tips into frequency and amounts.

5.3.1 Linear Probability Model

One can determine the probability of an individual choosing to tip or not to tip with the help of a linear probability model. The linear probability model contains the same number of observations as the full model, separating into three Weighted Least Squares (WLS) regressions. See Appendix 4.1 for a description of

the WLS procedure. The dependent variable is the number of tips (0,1), instead of percent tip. Analysis is based on Equation 1, since it contains the most number of observations and has the highest adjusted R^2 value (0.420). Equation 2 and Equation 3 are only used to obtain estimated coefficients for the server's income variable and the bill size variable. Equations 1, 2 and 3 are used to explore different motives of tipping behaviour and they portray tip percentages as being determined by different factors. The following is a summary of the results of the Linear Probability Model: (Please refer to Appendix 4 for complete regression results)

Table 9: Regression Results (Linear Probability Model)

Equation 1 (1458 observations)					Equation 2 (324 observations)				Equation 3 (324 observations)			
Variable	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.
Constant	0.943	0.053	17.863	0.000	1.062	0.046	23.245	0.000	0.945	0.062	15.268	0.000
Age	0.006	0.002	2.303	0.021	0.002	0.002	1.112	0.267	0.004	0.003	1.188	0.236
Male	-0.032	0.012	-2.617	0.009	0.004	0.009	0.418	0.676	-0.031	0.014	-2.179	0.030
AsianOrigin	-0.103	0.019	-5.494	0.000	-0.109	0.023	-4.766	0.000	-0.055	0.022	-2.515	0.012
OtherOrigin	-0.068	0.037	-1.867	0.062	-0.160	0.048	-3.355	0.001	-0.145	0.063	-2.299	0.022
Humanities	-0.119	0.025	-4.759	0.000	-0.100	0.024	-4.244	0.000	-0.041	0.023	-1.783	0.076
NatScience	-0.040	0.017	-2.399	0.017	-0.096	0.023	-4.127	0.000	-0.005	0.024	-0.195	0.845
SocScience	-0.024	0.018	-1.367	0.172	-0.099	0.024	-4.052	0.000	-0.029	0.017	-1.669	0.096
Commerce	-0.015	0.016	-0.886	0.376	-0.076	0.023	-3.312	0.001	-0.060	0.022	-2.689	0.008
OtherMajor	0.014	0.019	0.748	0.454	-0.080	0.025	-3.258	0.001	-0.036	0.026	-1.381	0.168
Graduate	0.051	0.023	2.225	0.026	0.015	0.017	0.937	0.350	0.024	0.022	1.086	0.279
Income	-0.000	0.000	-1.510	0.131	0.000	0.000	1.580	0.115	0.000	0.0000	2.937	0.004
	0168	0111			0155	00978			0313	107		
HousNPaid	0.007	0.012	0.615	0.539	-0.039	0.014	-2.851	0.005	-0.080	0.021	-3.867	0.000
TuitNPaid	-0.020	0.012	-1.592	0.112	-0.015	0.011	-1.322	0.187	0.013	0.015	0.876	0.382
InfreqRest	-0.015	0.011	-1.362	0.173	-0.014	0.009	-1.549	0.122	-0.000	0.009	-0.018	0.985
DineAlone	-0.094	0.014	-6.779	0.000								
Dine10ppl	-0.028	0.011	-2.478	0.013								
ExcServ	0.052	0.011	4.562	0.000								
PoorServ	-0.525	0.023	-22.338	0.000								
Inc>25000					-0.022	0.010	-2.314	0.021				
Bill\$100									0.024	0.013	1.897	0.059

The base group is made up of undergraduate female tippers from Canada majoring in economics with housing and tuition paid for by a third party. They are assumed to be in a frequented restaurant, dining in a group of 2, provided with average service, given a \$10 bill and served by a server whose annual income was less than \$10000 per year. According to my results (Equation 1), the probability

that someone in the base group would tip is:

$$\begin{aligned}\text{Probability} &= \alpha + \beta(\text{Mean Age}) + \gamma(\text{Mean Income}) \\ &= 0.943 + 0.006(21.778) + 0.000(707.84) \\ &= 1.07\end{aligned}$$

Therefore one can be certain that a typical person in the base group of this study would tip under the specific circumstances outline above.

Interpretations

Coefficients are estimated probabilities. For example, a male coefficient of -0.03 implies that male tippers are 3% less likely to tip than female tippers. A coefficient that is smaller than 5% of the mean tipping probability (0.05) is said to be not important, while a coefficient that is larger than 5% of the mean tip is said to be important. A 5% marginal change in tipping probability is assumed to be important from both the server's and the tipper's perspective.

I choose a 5% change in tipping probability as a benchmark for economic importance because it seems appropriate. A probability change that is smaller than 5% seems to be too small from the tipper's perspective. For instance, a 3% change in probability is too small to have an economic importance, even when it is statistically significant. Therefore 5% seems to be a reasonable standard; it is easier to interpret and less perplexing than other numbers (i.e. 3% or 4%). Such a change

is also economically important from both the server's and the tipper's perspective.

A coefficient is said to have important size effect when it is larger than 5% of the mean tipping probability. If a tipper is going to tip for certain, a 5% decrease in tipping probability means the tipper becomes only 95% likely to tip. The tipper will not tip 1 out of 20 times of dining out. Since a large number of tables are served during a shift, a 5% change in tipping probability is also important from the server's perspective. If a server serves 20 tables per night, a 5% decrease in tipping probability means he or she will not receive tips from 1 table. In general, a 5% change in probability would be considered as important and a change smaller than 5% seems negligible.

- Age is negatively related to the number of tips and is significant at the 95% significance level. Size of the coefficient can be important (0.006).
- The coefficient of Male is negative and statistically significant. The coefficient is -0.03 , which is not important. This implies that male tippers are 3% less likely to tip than female tippers. An advantage of including the two-step analysis is that it provides a more dynamic understanding of tipping behaviour. This is demonstrated with the male coefficients, since men do tip more (positive coefficient in the full model) but they are found to be less likely to tip.

- Coefficients of AsianOrigin (-0.10) and OtherOrigin (-0.07) both have negative signs. The AsianOrigin coefficient is significant and the OtherOrigin coefficient is not. This implies that people from Asian backgrounds are 10% less likely to tip than Canadians. One cannot be sure about the relationship between people from ethnic backgrounds other than Canada and Asia and the decision to tip. OtherOrigin and AsianOrigin are the third and fifth largest variable affecting an individual's decision to tip; sizes of the coefficients are important.
- The coefficients for the variables Humanities (-0.12) and NatScience (-0.04) bear negative signs and are statistically significant. Humanities is the second largest variable affecting an individual's decision to tip; the coefficient is important. A student majoring in humanities is 12% less likely to tip than an economics student. The NatScience coefficient is not important in size; a student majoring in the natural sciences is 4% less likely to tip than a student in economics. The SocScience (-0.02) and Commerce (-0.01) coefficients are negative and not important in size. The OtherMajor coefficient (0.01) is positive and not important. These variables are all statistically insignificant. This study does not provide conclusive results on these variables' relationship with the decision to tip.

- The Graduate coefficient (0.05) is positive and significant at the 95% significance level. The coefficient have important size effect. A graduate student is 5% more likely to tip than an undergraduate student.
- Income is positively related to tipping and is statistically insignificant. The coefficient can be important given a large range of income (close to 0).
- The HousNPaid and TuitNPaid coefficient are both statistically insignificant. HousNPaid is positive and TuitNPaid is negative. They are not important in size (0.01 and -0.02 respectively). One cannot be sure about the relationship between housing and tuition being paid by a third party and the decision to tip or not.
- The InfreqRest coefficient (-0.02) is negative and statistically insignificant. One cannot be certain about the relationship between patronage frequency and the decision to tip. The size of the coefficient is not important.
- The DineAlone (-0.09) and Dine10ppl (-0.03) coefficients are both negative and significant. The DineAlone coefficient is the fourth largest variable affecting an individual's decision to tip. It is 9% less probable for someone dining alone to tip comparing to someone dining in a group of two. On the other hand, the Dine10ppl coefficient does not have important size effect. An individual dining in a group of 10 is 3% less likely to tip than someone dining in a group

of 2.

- The ExcServ coefficient (0.05) is positive and the PoorServ (-0.52) coefficient is negative. Both variables are statistically significant and have important size effects. A person who is provided with excellent service is 5% more likely to tip than someone provided with average service. Poor Service is the biggest factor that has an effect on the decision to tip or not to tip. An individual who receives poor service is 52% less likely to tip than someone who receives average service. This implies that service quality really matters; individuals have the tendency to punish lousy servers by leaving no tip at all.
- The Inc>25000 coefficient (-0.02) is negative and is statistically significant. It does not have important size effect. Someone who is served by a server whose annual income is over \$25000 is 2% less likely to tip than someone who is served by a low-income server (with annual income less than \$10000).
- The coefficient of Bill\$100 is positive and insignificant. The coefficient of 0.02 is not important in size. However, I am not confident about the relationship between bill size and the decision to tip.

Elasticity

It is more meaningful to discuss the coefficients for continuous variables in terms of elasticity. There is a limited range of age and income because the subjects

of this study are university students. There would definitely be a larger range in the real world. The Age coefficient is -0.006. A ten-year increase in the age of an individual results in a 6% increase in the number of tips. This is a small coefficient. The age elasticity of tipping probability is calculated as follows:

$$\begin{aligned}
 \text{Elasticity} &= (d\text{Tip}/d\text{Age}) * (\text{Age}/\text{Tip}) \\
 &= \text{Age Coefficient} * (\text{Mean Age}/\text{Mean Number of Tips}) \\
 &= 0.006 * (21.778/0.782) \\
 &= 0.102
 \end{aligned}$$

An elasticity of 0.10 implies a 10% increase in mean age (2.18 years) will result in a 1% increase in mean tipping probability (0.8 percentage point). The probability of tipping is inelastic with respect to age of the individual, which means that the age effect on tipping probability is not large. However, the age effect can be large if we can extrapolate to a larger age range.

The Income coefficient is 0.0000168. A \$1000 increase in an individual's income will result in a 1.7% increase in the probability that an individual will choose to tip. The coefficient is very small; therefore the effect of income on the number of tips is minimal. The income elasticity of tipping probability is:

$$\begin{aligned}
 \text{Elasticity} &= (d\text{Tip}/d\text{Income}) * (\text{Income}/\text{Tip}) \\
 &= \text{Income Coefficient} * (\text{Mean Income}/\text{Mean Tipping Probability})
 \end{aligned}$$

$$= 0.0000168*(707.840/0.782)$$

$$= 0.01$$

This implies that a 100% increase in mean income (\$707.8) will result in a 1% increase in mean tipping probability (0.8 percentage points). The probability of tipping is very inelastic with respect to income of the individual, which means that the income effect on tipping probability is small. However, the income effect can be large if we can extrapolate to a larger range of income.

5.3.2 Conditional Model

I then proceed to analyzing the data with respect to those who choose to tip. I decided to build a conditional model containing only the observations with percent tips greater than zero. The conditional model examines the behaviour of tippers based on the condition that these individuals choose to tip (tip percent greater than 0). Observations with zero percent tips are neglected from the data set; three separate OLS regressions were run with 1140, 314 and 312 observations. Analysis is based on Equation 1, since it contains the most number of observations and has the highest adjusted R^2 value (0.307). Equation 2 and Equation 3 are only used to obtain estimated coefficients for the server's income variable and the bill size variable. A summary of the regression results is presented in Table 10. (See Appendix 5 for complete regression results)

Table 10: Regression Results (Conditional Model)

Equation 1 (1140 observations) Equation 2 (314 observations) Equation 3 (312 observations)

Variable	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.	Coeff	Sd.Err	t-Stat	Prob.
Constant	8.978	1.336	6.718	0.000	12.852	2.353	5.463	0.000	9.420	2.509	3.754	0.000
Age	0.130	0.059	2.206	0.028	0.102	0.107	0.953	0.341	0.234	0.114	2.058	0.040
Male	1.047	0.308	3.392	0.001	0.266	0.530	0.501	0.616	0.850	0.571	1.488	0.138
AsianOrigin	-3.426	0.448	-7.657	0.000	-4.665	0.818	-5.706	0.000	-4.731	0.857	-5.521	0.000
OtherOrigin	-7.120	0.808	-8.807	0.000	-9.753	1.501	-6.499	0.000	-7.421	1.596	-4.651	0.000
Humanities	-3.166	0.566	-5.594	0.000	-4.619	0.983	-4.698	0.000	-4.239	1.041	-4.071	0.000
NatScience	-2.444	0.532	-4.591	0.000	-4.681	0.966	-4.846	0.000	-3.817	1.003	-3.805	0.000
SocScience	-2.215	0.500	-4.433	0.000	-3.217	0.916	-3.513	0.001	-1.105	0.951	-1.162	0.246
Commerce	0.014	0.479	0.030	0.976	-1.799	0.863	-2.085	0.038	0.497	0.931	0.534	0.594
OtherMajor	-2.687	0.553	-4.858	0.000	-4.010	1.011	-3.968	0.000	-2.109	1.076	-1.960	0.051
Graduate	0.738	0.493	1.496	0.135	0.190	0.900	0.211	0.833	-0.783	0.962	-0.814	0.416
Income	0.002	0.000	6.877	0.000	0.003	0.000	5.547	0.000	0.002	0.000	3.193	0.002
HousNPaid	0.595	0.377	1.578	0.115	1.651	0.654	2.523	0.012	1.308	0.712	1.838	0.067
TuitNPaid	-1.881	0.347	-5.417	0.000	-3.233	0.623	-5.191	0.000	-3.395	0.668	-5.082	0.000
InfreqRest	-0.921	0.275	-3.347	0.001	-0.320	0.491	-0.653	0.514	-0.648	0.524	-1.238	0.217
DineAlone	-0.166	0.338	-0.490	0.624								
Dine10ppl	0.555	0.333	1.664	0.096								
ExcServ	3.834	0.303	12.66	0.000								
			6									
PoorServ	-1.944	0.398	-4.883	0.000								
Inc>25000					-1.291	0.491	-2.630	0.009				
Bill\$100									-1.392	0.524	-2.656	0.008

The base group consists of undergraduate female tippers from Canada majoring in economics with housing and tuition paid for by a third party. They are assumed to be in a frequented restaurant, dining in a group of 2, provided with average service, given a \$10 bill and served by a server whose annual income was less than \$10000.

According to my results (Equation 1), the base group would tip:

$$\begin{aligned}
\text{Mean Tip} &= \alpha + \beta(\text{Mean Age}) + \gamma(\text{Mean Income}) \\
&= 8.978 + 0.130(21.778) + 0.002(707.84) \\
&= 13.22
\end{aligned}$$

Therefore a typical person in the base group of this study would tip 13.22% under the specific circumstances outline above. The mean of the regression (Equation 1) is 11.42, which is also higher than in the full model.

Interpretations

Since the dependent variable is the percent tip, the coefficients are interpreted as deviations around the mean. For example, a male coefficient of 1.05 implies male tippers tip 1.05 percentage points extra when compared to females. Therefore if a female tipper tip 10%, then a male tipper will tip 11.05%. A coefficient that is smaller than 10% of the mean tip (1.32) is said to be not important, while a coefficient that is larger than 10% of the mean tip is said to be important. A marginal change of 1.32% is assumed to be important from both the server's and the tipper's perspective.

- Age is positively related to Tip and is statistically significant at the 95% significance level. This implies percent tip tends to increase with the tipper's age. This is contrary to the results reported by Lynn, Conlin and O'Donoghue (2003), which suggest a negative relationship. The Age coefficient is 0.13.

One-year increase in the age of an individual will result in a 0.1 percentage point increase in percent tip. This coefficient can be important given a large age range.

- The coefficient of Male is positive and significant at the 95% significance level.

This is contrary to the study by Bryant and Smith (1995), which suggests females tip more than males. However, the positive relationship is consistent with Lynn and McCall (2000)'s study, which states that male tend to tip more than female. The **Male** coefficient is 1.05, which is not important in size. This implies that a male tipper tends to tip 1 percentage point more than a female tipper.

- Coefficients of AsianOrigin and OtherOrigin both have negative signs and are statistically significant. This implies that Canadians tend to tip more than people from other backgrounds. This result is consistent with the study by Lynn and Haysbert (2003), which reported that Whites tip more than other ethnic groups. **AsianOrigin** and **OtherOrigin** are two of the variables with very important size effects (-3.43 and -7.12 respectively). Both of them are dummy variables; therefore a person from Canada tips 3.4 percentage points than a person from Asia. Someone from Canada also tips about 7 percentage points more than someone from neither Canada nor Asia. This is a substantial

difference in tip percentages

- The coefficients for the variables Humanities, NatScience, SocScience and OtherMajor all bear negative signs. They are also statistically significant. Commerce is the only variable positively related to percent tip in this category, but it is insignificant. The **Humanities** coefficient (-3.17), **NatScience** coefficient (-2.44), **SocScience** coefficient (-2.22) and **OtherMajor** coefficient (-2.69) are also important in size. This means someone majoring in Humanities tend to tip 3 percentage points less than someone in Economics. Students with a natural science and social science major tip 2.4 and 2.2 percentage points less than an Economics student. Students in other majors tip 2.7 percentage points less than someone majoring in Economics. The **Commerce** coefficient is 0.01, which implies that a commerce student tips similarly as an Economics student. However, I am not certain about the relationship between Commerce and Tip because the variable is insignificant. These results contradict Frank (2005)'s finding that economists are less altruistic than non-economists.
- The Graduate variable is positively related to Tip and is insignificant at the 95% significance level. The **Graduate** coefficient is 0.74, which does not have important size effect. It is consistent with my expectation. A graduate

student tip 0.7 percentage point more than an undergraduate student. This relationship is also uncertain because the variable is insignificant.

- Income is positively related to tipping and is statistically significant. This is consistent with my expectation. The Income coefficient is close to 0, which can be important given a large range of income. A \$1000 increase in an individual's income will result in a 2-percentage point increase in tipping.
- HousNPaid and TuitNPaid are income-related variables. The HousNPaid coefficient is positive and insignificant, but the TuitNPaid coefficient is negative and significant. The sign of the TuitNPaid coefficient is consistent with my expectations, but the HousNPaid coefficient is not. This not a major problem since HousNPaid is insignificant. The **HousNPaid** and **TuitNPaid** coefficients are 0.60 and -1.88 respectively. The TuitNPaid coefficient is more important in size than the HousNPaid coefficient. An individual who has his or her tuition paid for tip about 2% more than someone who pays for his or her own tuition. This is a moderate effect. Someone who has his or her housing expense paid for tends to tip about half a percentage point less than someone who does not. This is a strange conclusion because the HousNPaid variable is insignificant. I am not certain about the relationship between HousNPaid and Tip.

- The InfreqRest coefficient is negative and statistically significant. This is consistent with the study by Lynn and Grassman (1990), which states that tip amounts increase with patronage frequency. This result is contrary to my expectations as well as Bodvarsson and Gibson (1994)'s finding of a weak frequency-tip relationship. The **InfreqRest** coefficient is estimated as -0.92 , which is not important in size. Tippers dining in a frequented restaurant tip 1 percentage point more than in a restaurant that they will never go to again.
- The DineAlone coefficient is negative and the Dine10ppl coefficient is positive; they are both insignificant at the 95% significance level. This implies that Tip may increase with group size. Lynn, Conlin and O'Donoghue (2003) have similar findings. On the other hand, this is contrary to Bryant and Smith (1995)'s finding of a decreasing trend in tip rate as the size of the party increases. Both **DineAlone** and **Dine10ppl** have no important size effects (-0.17 and 0.56). A tipper who is dining alone tips 0.2 percentage point less than someone dining in a group of 2. Someone who dines in a group of 10 tends to tip half a percentage point more than someone dining in a group of 2. However, both variables are insignificant. This study does not provide conclusive results on the relationship between group size and tipping.
- The ExcServ coefficient is positive and the PoorServ coefficient is negative.

They are both statistically significant. This suggests that tip percentage increases with service quality. This conforms to my expectations and the study by Lynn, Conlin and O'Donoghue (2003). This is contrary to Lynn and McCall (2000), which concluded that service effect on tips is minimal. This result is also different than that obtained by Bodvarsson and Gibson (1994). The **ExcServ** coefficient is 3.83 and the **PoorServ** coefficient is -1.94. The coefficient for excellent service is much larger than the one for poor service. They both have important size effects. When provided with excellent service, tippers leave close to 4 percentage points more tips than with average service. This is significant since the difference is more than one-third of the average tip. If provided with poor service, tippers tend to tip 2 percentage points less than with average service. This is a moderate effect.

- **Inc>25000** is negatively related to Tip and is statistically significant. This implies that tip percentages tend to decrease with server's income and is consistent with my expectations. The **Inc>25000** coefficient is estimated as -1.29, which is not important in size. Someone who is served by a server with annual income over \$25000 tips 1.3 percentage points less than someone who is served by a low-income server (less than \$10000). Tippers are not as sensitive to the servers' income as expected.

- The coefficient of Bill\$100 is negative and significant. This suggests that tip percentage decreases with bill size. This is consistent with Lynn and others' results.³² The **Bill\$100** coefficient is -1.39 , which is important in size. This implies tips are 1.4 percentage points higher for \$10 bills than \$100 bills.

Elasticity

It is more meaningful to discuss the coefficients for continuous variables in terms of elasticity. There is a limited range of age and income because the subjects of this study are university students. There would definitely be a larger range in the real world. The Age coefficient is 0.13. One-year increase in the age of an individual will result in a 0.13 percentage point increase in tip. This is a small coefficient. The age elasticity of tipping is calculated as follows:

$$\begin{aligned}
 \text{Elasticity} &= (d\text{Tip}/d\text{Age}) * (\text{Age}/\text{Tip}) \\
 &= \text{Age Coefficient} * (\text{Mean Age}/\text{Mean Tip}) \\
 &= 0.130 * (21.778/11.416) \\
 &= 0.248
 \end{aligned}$$

An elasticity of 0.25 implies a 10% increase in mean age (2.18 years) will result in a

³² Lynn, Conlin and O'Donoghue (2003) found a negative relationship between bill size and tip. Bryant and Smith (1995), as well as Bodvarsson and Gibson (1994) found that tip percent depends on bill size..

2.5% increase in mean tip (0.28 percentage points). Percent tip is inelastic with respect to age of the tipper, which means that the effect of age on tipping is not large.

However, the age effect can be large if we can extrapolate to a larger age range.

The Income coefficient is 0.002. A \$1 increase in an individual's income causes a 0.002% increase in tip percentage. A more expressive interpretation is that a \$1000 increase in an individual's income will result in a 2% increase in tipping.

This is a very small coefficient. The income elasticity of tipping is:

$$\begin{aligned}\text{Elasticity} &= (d\text{Tip}/d\text{Income}) * (\text{Income}/\text{Tip}) \\ &= \text{Income Coefficient} * (\text{Mean Income}/\text{Mean Tip}) \\ &= 0.002 * (707.840/11.416) \\ &= 0.124\end{aligned}$$

This implies that a 100% increase in mean income (\$707.8) will result in a 12% increase in mean tip (1.4 percentage points). Tipping is very inelastic with respect to income of the tipper, which means that the effect of income level on tipping is small. However, the income effect can be large if we can extrapolate to a larger range of income.

5.4 Discussions

5.4.1 Findings by the Two-step Procedure

According to the linear probability model, it is very probable that individuals

would tip under normal circumstances. One can also be certain that individuals in the base group would decide to tip. This is supportive of the social norm hypothesis because individuals choose to tip even when they are not required to. On the other hand, I also found a large poor service coefficient. Individuals are very likely to punish servers who provide poor service by not tipping at all. This is very strong evidence for the incentive hypothesis. Tipping may be used as an incentive for quality service because individuals will not tip if service is poor. Tippers may believe that tipping may have an incentive effect on service even when it does not.

Mean tip for the conditional model is higher than the mean tip for the full model. However, it is still much lower than the findings in previous studies.³³ Eliminating the large numbers of zeros in the data set causes the increase in mean tip. Potential biases on the model are removed by the two-step procedure. The conditional model provides results similar to the full model. There is strong evidence for the incentive hypothesis because service quality is strongly related to percent tip. Patronage frequency is also related to tipping. The significant difference between people from different backgrounds can be viewed as evidence for the social norm hypothesis. Canadians are more familiar with the tipping norms in Canada than individuals from other backgrounds. Server's income level is related to percent tip. Individuals tip

³³ This is much lower than the 16.1% reported by Bryant and Smith (1995) and the 17.56% reported by Lynn, Conlin and O'Donoghue (2003).

more when server's income is low; a possible explanation is that people are tipping because of altruism or sympathy towards the server. People choosing to tip irrespective of service quality suggest that there may be a core tip that maybe affected by social norms or altruism. Altman (2005) develops the concept of core and marginal altruism in his forthcoming publication. The mean tip for people who do tip when given poor service in a restaurant they will never visit again is 9.19% (group of 2, poor service). This may be the core tip because service is poor and future service is not a consideration. See table 6 for summary statistics. The marginal tip may be the increment of tips when service quality improves. When service rises from poor to excellent, tip increases by 5.5 percentage points in such case (from 9.19 to 14.71).

5.4.2 Findings of the Full Model

The most dominant finding in this study is the large service coefficient. Service quality seems to be the major determinant of tips. Another important finding is the negligible difference in tips when patronage frequency varies. This suggests that individuals may be tipping to conform to social norms. The tipper's ethnic background also has large effects on tipping behaviour. One possible explanation would be different countries have different norms of tipping; individuals may be conforming to different sets of tipping norms.

Tipping can be a form of altruism. According to the estimated model, tip percent tends to decrease with bill size. This is consistent with the expectations of basic needs generosity because percent tipped decreases when the absolute value of the tip gets larger. Tipper's income is positively related to percent tip. This can be evidence for the "warm-glow" hypothesis. In addition, server's income has a negative relationship with tip percentage. Therefore individuals tend to give more tips to low-income servers. This can be viewed as a form of altruism.

Tipping can be viewed as a social norm. Tip percentage increases somewhat with party size, which suggests that people may be tipping to establish a reputation. However, this hypothesis is weak when compared with other hypotheses because the coefficient for a group size of 10 is small and insignificant. The large effect of service quality on tips implies that tippers calculate tips with respect to service. They do not just leave a fixed percentage of tips as specified by social norms. However, the tiny difference between tipping in frequented and not frequented restaurants support the social norm hypothesis. If individuals are all incentive-based, they should not tip in restaurant that they will never visit again. A convincing argument is that they are tipping to conform to social norms. Canadians are also found to tip more than people from other backgrounds. One possible explanation would be that Canadians are more familiar with the tipping norms in

North America.

Tipping can be used as an incentive for quality service. The results provide evidence that tips tend to increase largely with the level of service. This indicates a strong relationship between tip percent and service. The implicit tipping contract between tippers and servers will work very well in the presence of a strong relationship. Tippers may be using tips as means to reward fair treatment (outstanding service) and using zero tips to punish unfair treatment (poor service) as specified in strong reciprocity. According to the results of this study, patronage frequency also affects tip percentage. This can be viewed as evidence for the incentive hypothesis because frequent customers may be tipping more to encourage quality service.

Findings from this study suggest that tipping is a multi-faceted phenomenon. There seems to be a core component and a marginal component to tips. Individuals tend to have a fixed core amount that they would tip under normal circumstances that may be determined by social norms or “warm glow”. Personal attributes such as ethnic background, discipline, age, sex, income and level of education also affect this core component to a certain extent. Individuals would also have a marginal component that is determined by service quality and other minor factors such as the group size, server’s income, bill size and patronage frequency.

CHAPTER 6

Conclusion

Tipping is an intriguing phenomenon that has serious social and economic implications. Therefore it is important to recognize tipping as an economic activity and to conduct in-depth analysis on the issue. This study emphasizes the socio-economic motives underlying tipping behaviour. I attempt to verify the neoclassical and behavioural theories that rationalize tipping behaviour with empirical evidence. The three major hypotheses identified describe tipping as a form of altruism, as conforming to social norms and as an incentive for quality service. A survey was conducted to obtain my own data, which the analysis is based upon. I attempt to test these hypotheses with evidence from my data.

Results from this study can be generalized to a certain extent. Subjects of this study are students from the University of Saskatchewan; therefore similar results are expected if the same study was applied in other universities of North America.

There may be different results if the study was applied to subjects other than university students. Individuals with different personal characteristics and experience may behave differently. Results may vary if the study was conducted

in places that are very different than Saskatoon. There may be differences that are caused by cultural and social norms, but similar patterns should be observed throughout the world.

6.1 Summary of Findings

According to evidence from this study, tipping can be a form of altruism. In the estimated models, tip amount has a negative relationship with bill size. This is consistent with the expectations of basic needs generosity. In addition, server's income is negatively related to tip percentage. Therefore individuals tend to give more tips to low-income servers. This can be viewed as a form of altruism.

In this study, it is evident that tippers can be viewed as conforming to social norm. Percent tip increase somewhat with party size, which suggests that people may be tipping to establish reputation. The negligible difference between tipping in frequented and not frequented restaurants support the social norm hypothesis. If individuals are all incentive-based, they should not tip in restaurant that they will never visit again. Therefore they must be tipping to conform to social norms. The tipper's ethnic background also has large effects on tipping behaviour. One possible explanation would be different countries have different norms of tipping; individuals may be conforming to different sets of tipping norms.

According to my results, service quality seems to be the major determinant of tips. This verifies that tipping can be used as an incentive for quality service. The results show that percent tip is strongly related to the level of service. The implicit tipping contract between tippers and servers will work very well in the presence of a strong relationship. The fact that patronage frequency affects tip percentage can also be viewed as evidence for the incentive hypothesis because frequent customers may be tipping more to encourage quality service. About a quarter of the respondents choose to tip even when service is poor. Without future service considerations, the mean tip when service is poor (9.19%) can be viewed as the core tip that is likely shaped by social norms and altruism. The marginal tip can be viewed as the increment in tips when service improves (5.5%). Individuals may be tipping to reward outstanding service and not tipping to punish poor service.

6.2 Neoclassical and Behavioural Theories

All three hypotheses are verified with the evidence in this study. Therefore, both neoclassical and behavioural theory on tipping can be true. Neoclassical theory suggests that individuals who tip are always incentive-based. An acceptable explanation in neoclassical theories is that individuals are using tipping to induce quality service. It is also possible that individuals who tip derive utility from the

“warm-glow”. In behavioural economics, tipping can be caused by these two reasons, as well as social norms. Open-ended behavioural theory accepts that tipping can fulfill both incentive and norm-altruism ends. Tipping can be a form of altruism and individuals may be maximizing a utility function that incorporates altruism. Tips can also be used as an incentive for better services, which is consistent with Leibenstein’s x-efficiency theory in behavioural economics. Tippers can also be conforming to existing social norms. Violating the social norms of tipping may cause embarrassment for the individual; therefore they tip to avoid such disutility.

Tipping will work really well as an implicit contract for quality service between customers and servers. Someone may have doubts about the effectiveness of tipping since tips are post-service rewards. In fact, tipping would be an effective implicit contract due to expectations on both sides of the contract. Customers expect to receive quality service; servers’ expect to receive a certain percentage of tips. Servers will provide better service in the hope of getting good tips.

Therefore, tipping can be viewed as a multi-faceted phenomenon. There seems to be a variety of reasons as to why a person would tip. The motives behind tipping behaviour can be better explained by a combination of both neoclassical and behavioural theories. Individuals can be tipping to be altruistic, to conform to

social norms and to induce quality service simultaneously.

6.3 Future Research

Several suggestions for future research can be drawn from my experience in this study. It is ideal to use a focus group if original contributions on tipping behaviour are desired. Researchers may want to use a focus group that consists of both servers and tippers; it can give original ideas and insights to the kind of questions to be asked. Structuring the questions in such a way that all data can be analyzed with one estimate equation will simplify the econometric analysis. According to my experience, interpreting the size effect gives additional insights into tipping as opposed to interpreting the signs of the coefficients alone.

Experience in the tip-receiving industry is a factor that may have an effect on tipping. Individuals who have work experience as waiters and waitresses may tip differently than individuals who do not have such experience. It would be an area of interest for researchers looking for original ideas and contributions.

There are other areas of tipping that were not included into the scope of this study. These areas include the difference in tipping between smokers and non-smokers, as well as the effect of tipping on corporations. It is believed that investigating these aspects of tipping behaviour will yield valuable insights into

tipping behaviour.

6.3.1 Difference between Smokers and Non-smokers

It is possible for tipping to be analyzed as a form of compensation for taking risks. Results from Bryant and Smith (1995) suggest a slight difference in tipping behaviour for smokers and non-smokers. The tendency for smokers to tip more can be caused by the negative externalities generated by smoking. Servers who work at a restaurant that allows smoking are subject to second hand smoke, which is unpleasant to most people. Second hand smoke also causes higher risk of cancer and heart diseases. Workers may need to be compensated for taking such risks. It is possible for individuals to have moral values that allows for compensation of harms imposed on others.

6.3.2 Tipping on Corporations

There is a tendency for people to tip more when they are on business trips or when the bill can be credited as expense in corporations. This can be analyzed as other people's money (OPM) problem in economics. The firm's objective may not be the same as the individual worker's objective. Workers will choose to maximize their own utility function as opposed to the firm's profit function. By tipping a larger amount, individuals can earn positive utility by gaining reputation and respect from others. It will generate even more utility if the person is altruistically inclined.

The worker will definitely choose to tip more because the cost is imposed on the corporation, not the worker himself. By choosing to tip a larger amount, the worker is maximizing his utility function. However, this will cause the firm to operate less efficiently if the productivity of the worker has not increased as a result of increased tipping.

6.4 Conclusion

The main purpose of this research paper is to analyze tipping behaviour and its underlying socioeconomic motives. After reviewing the literature, conducting surveys and analyzing the evidence, several conclusions can be drawn. Behavioural theory enriches our understanding of tipping more so than would a simple reliance upon neoclassical theories.

Evidence from this study supports the hypothesis of tipping as a form of altruism. It is also verified that individuals may be tipping to conform to existing social norms. According to my results, individuals are also using tipping as an incentive for better service. People can be incentive-based as assumed in neoclassical theories, but they may incorporate altruism and social norms into the decision of tipping. It is not realistic to make the assumption that individuals are single-minded and have only one motive. All three hypotheses are verified; it is

evident that people tip because of a variety of reasons. A combination of both neoclassical and behavioural theories would best explain tipping behaviour.

Tipping should be viewed as a multi-faceted phenomenon. According to my results, there may be a core component and a marginal component to tipping. The core is basically determined by social norm and altruism, while the marginal component is mostly determined by service quality.

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Appendix 1:

Application for Approval of Research Protocol

1. Researcher: Shu Fung Fong, M.A. student, Department of Economics
Supervisor: Morris Altman, Professor, Department of Economics
 - 1a. Student: Shu Fung Fong, M.A. student
 - 1b. Anticipated start date of study: 1st September, 2004
Expected completion date of study: 30th October, 2004
2. Title of study: The Socioeconomic Motivation Underlying Tipping Behaviour
3. Abstract: The research will test several hypotheses about the motivation behind tipping behaviour. Given meaningful data, a part will be devoted to investigate the effect of age, ethnic differences, discipline, gender and income of tippers on tipping behaviour. The method of conducting a survey on a sample group will be used.
Hypothesis A: Altruism can be a motivation behind tipping. People are altruistically inclined because they tend to maximize a utility function that incorporates altruism. Workers in the tip-receiving industries usually earn lower wage, therefore people would want to help by tipping them.
Hypothesis B: People may choose to tip to conform to social norms. They may feel necessary to establish reputation by tipping. Tip to avoid disutility from “looking bad”. People may use social norms as shortcuts to determine tip amount.
Hypothesis C: Tipping can be an incentive for quality service. People may tip to encourage servers to provide better service or to reward quality service.
Questions will be asked on the amount a participant will tip in different scenarios. The participant will also be asked to provide information on their age, gender, place of origin, discipline, disposable income and whether they are graduate or undergraduate students.
4. Funding: None.
5. Participants: The researcher (Shu Fung Fong) will be going to different classes in the College of Arts and Science and make announcements about the research. Information sheets about the research will be distributed to those students. There will also be posters about the research at various locations on campus. The researcher’s contact information will be printed on both information sheets and posters so students can contact the researcher if they are interested in participating.
- 5a. Recruitment material: Please see attached poster. The poster will be handed out as information sheets as well.
6. Consent: Participants will be informed orally their rights, including their rights to withdraw and to refuse to answer individual questions. Their rights are also listed in the consent form that they are asked to sign prior to participation. Participants will be given several opportunities to raise questions and to withdraw their consent before and during the completion of the survey. Please see attached consent form.

Shu Fung Fong

15. Contact Name and Information: Shu Fung Fong, Tel: (306)251-0809
Email: tomatofong@hotmail.com
Address: 3525, Diefenbaker Dr, Saskatoon, SK, S7L 4V9, Canada

CONSENT FORM

*You are invited to participate in a study entitled **The Socioeconomic Motivation Underlying Tipping Behaviour**. Please read this form carefully, and feel free to ask questions you might have.*

Researcher: Shu Fung Fong, M.A. student, Department of Economics, University of Saskatchewan, (306)251-0809.

Supervisor: Morris Altman, Professor, Department of Economics, University of Saskatchewan, (306)966-5198.

Purpose and Procedure: Purpose of the study is to test the validity of some economic theories on the motives behind tipping and to investigate the effects of different variables on tipping behaviour. Data will be collected by conducting a survey on university students. Participants will complete the survey in a classroom on campus. Completing the survey should take about 15 minutes.

Potential Risks: There are no known risks in participating in this research. A copy of the thesis containing information on the results of the research will be made available in the Department of Economics Library (Arts 807) once the study has ended. If information on the results of the study is needed, you can contact the researcher at 251-0809.

Confidentiality: Although the data from this study will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals. Moreover, the consent forms will be stored separately from the questionnaires, so that it will not be possible to associate a name with any given set of responses. Please do not put your name or other identifying information on the questionnaire.

Right to Withdraw: *You may withdraw from the study for any reason, at any time, without penalty of any sort, you may refuse to answer individual questions (and without loss of relevant entitlements, without affecting academic or employment status, without losing access to relevant services etc). If you withdraw from the study at any time, any data that you have contributed will be destroyed.*

Questions: *If you have any questions concerning the study, please feel free to ask at any point; you are also free to contact the researchers at the numbers provided above if you have questions at a later time. This study has been approved on ethical grounds by the University of Saskatchewan Behavioural Sciences Research Ethics Board on (17 Sept, 2004). Any questions regarding your rights as a participant may be addressed to that committee through the Office of Research Services (966-2084). Out of town participants may call collect.*

Consent to Participate: *I have read and understood the description provided above; I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I consent to participate in the study described above, understanding that I may withdraw this consent at any time. A copy of this consent form has been given to me for my records.*

(Signature of Participant)

(Date)

(Signature of Researcher)

Research in Tipping Behaviour

You are invited to participate in a research project on tipping behaviour. The research will occur during the months of September and October, 2004.

Purpose of the study is to investigate the effects of different variables on tipping behaviour and to identify relevant economic theories on motives behind tipping behaviour.

Benefits of this research include insights into tipping as an economic behaviour, which enable us to design better government policies.

Participating in this research takes about 15 minutes. Participants will be asked to complete a questionnaire in a classroom on campus.

It only requires 15 minutes of your valuable time, and your participation is very much appreciated.

If you are interested in participating, please contact Shu at 251-0809 or tomatofong@hotmail.com to arrange for a time that is convenient to you.

Contact: Shu Fung Fong, M.A. Student, Dept. of Economics

Tel: 251-0809

Email: tomatofong@hotmail.com



SEP 22 2004

**UNIVERSITY OF SASKATCHEWAN
BEHAVIOURAL RESEARCH ETHICS BOARD**

<http://www.usask.ca/research/ethics.shtml>

NAME: Morris Altman (Shu Fung Fong)
Department of Economics

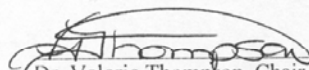
Beh 04-187

DATE: September 17, 2004

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the revisions to Application for Ethics Approval for your study "The Socioeconomic Motivation Underlying Tipping Behaviours" (Beh 04-187).

1. Your study has been APPROVED.
2. Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Committee consideration in advance of its implementation.
3. The term of this approval is for 5 years.
4. This approval is valid for one year. A status report form must be submitted annually to the Chair of the Committee in order to extend approval. This certificate will automatically be invalidated if a status report form is not received within one month of the anniversary date. Please refer to the website for further instructions
<http://www.usask.ca/research/behavrsc.shtml>

I wish you a successful and informative study.


Dr. Valerie Thompson, Chair
University of Saskatchewan
Behavioural Research Ethics Board

VT/ck

Office of Research Services, University of Saskatchewan
Room 1607, 110 Gymnasium Place, Box 5000 RPO University, Saskatoon SK S7N 4J8 CANADA
Telephone: (306) 966-8576 Facsimile: (306) 966-8597
<http://www.usask.ca/research>



OCT 15 2004

UNIVERSITY OF SASKATCHEWAN
BEHAVIOURAL RESEARCH ETHICS BOARD

NAME: Morris Altman
Economics


Beh #04-187

DATE: October 12, 2004

The University of Saskatchewan Behavioural Research Ethics Board has reviewed the modifications to the Application for Ethics Approval for your study " The Socioeconomic Motivation Underlying Tipping Behaviours" (Beh #04-187).

1. The modification(s) to your study, received October 5, 2004, has been APPROVED.
2. Any significant changes to your study should be reported to the Chair for Committee consideration in advance of its implementation.
3. The term of this approval remains five years from the original approval date.
4. In order to maintain ethics approval, a status report must be submitted to the Chair for Committee consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: <http://www.usask.ca/research/ethics.shtml>.

I wish you a successful and informative study.


Dr. Valerie Thompson, Chair
University of Saskatchewan
Behavioural Research Ethics Board

VT/ek

Appendix 2.1: Questionnaire (1st Version)

You are about to participate in a research project on tipping behaviour. Completing the questionnaire should take about 15 minutes. Please do not speak with the other participants in the room during the session. Please answer the following questions carefully.

Please provide the following information about yourself:

Age: _____

Sex: Male / Female

Place of Origin: Canada / Other: _____

Major: Economics / Other: _____

Year of Study: Undergraduate / Graduate

After-tax income (including parental or other support): \$_____ per month

Is your housing paid for by a third party (i.e. parents and friends)? Yes / No

Is your tuition paid for by a third party (i.e. parents and friends)? Yes / No

QUESTIONNAIRE

Part A:

For the following questions, please assume that you are dining in a restaurant that you frequently go to (i.e. twice a week):

1. How much will you tip if you are alone and service was excellent? _____ %
How much will you tip if you are alone and service was average? _____ %
How much will you tip if you are alone and service was poor? _____ %
2. How much will you tip if you are in a group of 2 people and service was excellent? _____ %
How much will you tip if you are in a group of 2 people and service was average? _____ %
How much will you tip if you are in a group of 2 people and service was poor? _____ %
3. How much will you tip if you are in a group of 10 people and service was excellent? _____ %
How much will you tip if you are in a group of 10 people and service was average? _____ %
How much will you tip if you are in a group of 10 people and service was poor? _____ %
4. How much will you tip if you know your server's annual income is over \$25000 and service was average? _____ %
How much will you tip if you know your server's annual income is less than \$10000 and service was average? _____ %
5. How much will you tip if the size of the bill is \$10 and service was average? _____ %
How much will you tip if the size of the bill is \$100 and service was average? _____ %

Part B:

For the following questions, please assume that you are dining in a restaurant that you will never go to again:

1. How much will you tip if you are alone and service was excellent? _____ %
How much will you tip if you are alone and service was average? _____ %
How much will you tip if you are alone and service was poor? _____ %
2. How much will you tip if you are in a group of 2 people and service was excellent? _____ %
How much will you tip if you are in a group of 2 people and service was average? _____ %
How much will you tip if you are in a group of 2 people and service was poor? _____ %
3. How much will you tip if you are in a group of 10 people and service was excellent? _____ %
How much will you tip if you are in a group of 10 people and service was average? _____ %
How much will you tip if you are in a group of 10 people and service was poor? _____ %
4. How much will you tip if you know your server's annual income is over \$25000 and service was average? _____ %
How much will you tip if you know your server's annual income is less than \$10000 and service was average? _____ %
5. How much will you tip if the size of the bill is \$10 and service was average? _____ %
How much will you tip if the size of the bill is \$100 and service was average? _____ %

Part C:

For the following questions, please assume that you are dining in a restaurant that you frequently go to (i.e. twice a week). Please give answers in dollar amounts:

1. How much will you tip if you are alone and service was average? \$ _____
2. How much will you tip if you are in a group of 2 people and service was average? \$ _____
3. How much will you tip if you are in a group of 10 people and service was average? \$ _____
4. How much will you tip if the size of the bill is \$10 and service was average? \$ _____
5. How much will you tip if the size of the bill is \$100 and service was average? \$ _____

Appendix 2.2: Questionnaire (2nd Version)

You are about to participate in a research project on tipping behaviour. Completing the questionnaire should take about 15 minutes. Please do not speak with the other participants in the room during the session. Please answer the following questions carefully.

Please provide the following information about yourself:

Age: _____

Sex: Male / Female

Place of Origin: Canada / Other: _____

Major: Economics / Other: _____

Year of Study: Undergraduate / Graduate

After-tax income (including parental or other support): \$_____ per month

Is your housing paid for by a third party (i.e. parents and friends)? Yes / No

Is your tuition paid for by a third party (i.e. parents and friends)? Yes / No

QUESTIONNAIRE

Part A:

For the following questions, please assume that you are dining in a restaurant that you frequently go to (i.e. twice a week):

1. How much will you tip if you are alone and service was excellent? _____ %
How much will you tip if you are alone and service was average? _____ %
How much will you tip if you are alone and service was poor? _____ %
2. How much will you tip if you are in a group of 2 people and service was excellent? _____ %
How much will you tip if you are in a group of 2 people and service was average? _____ %
How much will you tip if you are in a group of 2 people and service was poor? _____ %
3. How much will you tip if you are in a group of 10 people and service was excellent? _____ %
How much will you tip if you are in a group of 10 people and service was average? _____ %
How much will you tip if you are in a group of 10 people and service was poor? _____ %
4. How much will you tip if you know your server's annual income is over \$25000 and service was average? _____ %
How much will you tip if you know your server's annual income is less than \$10000 and service was average? _____ %
5. How much will you tip if the size of the bill is \$10 and service was average? _____ %
How much will you tip if the size of the bill is \$100 and service was average? _____ %

Part B:

For the following questions, please assume that you are dining in a restaurant that you will never go to again:

1. How much will you tip if you are alone and service was excellent? _____ %
How much will you tip if you are alone and service was average? _____ %
How much will you tip if you are alone and service was poor? _____ %
2. How much will you tip if you are in a group of 2 people and service was excellent? _____ %
How much will you tip if you are in a group of 2 people and service was average? _____ %
How much will you tip if you are in a group of 2 people and service was poor? _____ %
3. How much will you tip if you are in a group of 10 people and service was excellent? _____ %
How much will you tip if you are in a group of 10 people and service was average? _____ %
How much will you tip if you are in a group of 10 people and service was poor? _____ %
4. How much will you tip if you know your server's annual income is over \$25000 and service was average? _____ %
How much will you tip if you know your server's annual income is less than \$10000 and service was average? _____ %
5. How much will you tip if the size of the bill is \$10 and service was average? _____ %
How much will you tip if the size of the bill is \$100 and service was average? _____ %

Part C:

For the following questions, please assume that you are dining in a restaurant that you frequently go to (i.e. twice a week). Please give answers in dollar amounts:

1. How much will you tip if you are alone and service was average, if the bill was \$20? \$ _____
2. How much will you tip if you are in a group of 2 people and service was average, if the bill was \$20? \$ _____
3. How much will you tip if you are in a group of 10 people and service was average, if the bill was \$20? \$ _____
4. How much will you tip if the size of the bill is \$10 and service was average? \$ _____
5. How much will you tip if the size of the bill is \$100 and service was average? \$ _____

Appendix 3: Complete Regression Results (Full Model)

Dependent Variable: TIP

Method: Least Squares

Date: 01/18/05 Time: 12:40

Sample: 1 1458

Included observations: 1458

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)
 *ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NATURAL_SCIENCE
 S+C(8)*SOCIAL_SCIENCES+C(9)*COMMERCE+C(10)
 *MAJOR_OTHER+C(11)*GRAD+C(12)*INCOME+C(13)
 *HOUS_NOT_PAID+C(14)*TUIT_NOT_PAID+C(15)
 *INFREQUENT_REST+C(16)*DINING_ALONE+C(17)
 *DINING_10PPL+C(18)*EXC_SERVICE+C(19)*POOR_SERVICE

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	6.850371	1.256824	5.450542	0.0000
C(2)	0.187221	0.055868	3.351147	0.0008
C(3)	0.553955	0.281200	1.969967	0.0490
C(4)	-3.349777	0.426153	-7.860496	0.0000
C(5)	-7.732734	0.906247	-8.532698	0.0000
C(6)	-3.062740	0.534900	-5.725820	0.0000
C(7)	-1.322492	0.507799	-2.604362	0.0093
C(8)	-1.107014	0.483341	-2.290336	0.0221
C(9)	0.514675	0.456612	1.127161	0.2599
C(10)	-1.116263	0.543965	-2.052087	0.0403
C(11)	1.148857	0.479244	2.397227	0.0166
C(12)	0.001920	0.000246	7.798300	0.0000
C(13)	0.447386	0.343575	1.302150	0.1931
C(14)	-1.569652	0.332205	-4.724945	0.0000
C(15)	-1.124170	0.259409	-4.333589	0.0000
C(16)	-0.618313	0.317709	-1.946159	0.0518
C(17)	0.356975	0.317709	1.123591	0.2614
C(18)	4.117284	0.317709	12.95928	0.0000
C(19)	-5.992757	0.317709	-18.86239	0.0000
R-squared	0.478782	Mean dependent var	8.926283	
Adjusted R-squared	0.472262	S.D. dependent var	6.817479	
S.E. of regression	4.952598	Akaike info criterion	6.050647	
Sum squared resid	35296.11	Schwarz criterion	6.119517	
Log likelihood	-4391.922	Durbin-Watson stat	2.025442	

Dependent Variable: TIP

Method: Least Squares

Date: 01/13/05 Time: 16:34

Sample: 1 324

Included observations: 324

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)
 *ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NATURAL_SCIENCE
 S+C(8)*SOCIAL_SCIENCES+C(9)*COMMERCE+C(10)
 *MAJOR_OTHER+C(11)*GRAD+C(12)*INCOME+C(13)
 *HOUS_NOT_PAID+C(14)*TUIT_NOT_PAID+C(15)
 *INFREQUENT_REST+C(16)*INCOME25000

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	13.13381	2.381598	5.514704	0.0000

C(2)	0.127197	0.107599	1.182143	0.2381
C(3)	0.094674	0.541578	0.174812	0.8613
C(4)	-5.803036	0.820751	-7.070401	0.0000
C(5)	-10.78018	1.745388	-6.176377	0.0000
C(6)	-5.388394	1.030191	-5.230480	0.0000
C(7)	-5.223872	0.977996	-5.341405	0.0000
C(8)	-3.860508	0.930892	-4.147105	0.0000
C(9)	-2.369086	0.879413	-2.693941	0.0074
C(10)	-4.509238	1.047649	-4.304148	0.0000
C(11)	0.581450	0.923001	0.629956	0.5292
C(12)	0.002690	0.000474	5.674709	0.0000
C(13)	1.212991	0.661708	1.833120	0.0677
C(14)	-3.272973	0.639811	-5.115530	0.0000
C(15)	-0.555556	0.499608	-1.111982	0.2670
C(16)	-1.481481	0.499608	-2.965286	0.0033
R-squared	0.335751	Mean dependent var	10.90123	
Adjusted R-squared	0.303401	S.D. dependent var	5.387418	
S.E. of regression	4.496475	Akaike info criterion	5.892586	
Sum squared resid	6227.231	Schwarz criterion	6.079289	
Log likelihood	-938.5989	Durbin-Watson stat	2.052209	

Dependent Variable: TIP

Method: Least Squares

Date: 01/18/05 Time: 12:24

Sample: 1 324

Included observations: 324

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)
 *ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NATURAL_SCIENCE
 S+C(8)*SOCIAL_SCIENCES+C(9)*COMMERCE+C(10)
 *MAJOR_OTHER+C(11)*GRAD+C(12)*INCOME+C(13)
 *HOUS_NOT_PAID+C(14)*TUIT_NOT_PAID+C(15)
 *INFREQUENT_REST+C(16)*BILL100

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	8.399432	2.641231	3.180120	0.0016
C(2)	0.276918	0.119328	2.320634	0.0210
C(3)	0.087540	0.600619	0.145750	0.8842
C(4)	-5.377273	0.910226	-5.907625	0.0000
C(5)	-10.41963	1.935664	-5.382976	0.0000
C(6)	-4.229720	1.142499	-3.702166	0.0003
C(7)	-3.738311	1.084613	-3.446676	0.0006
C(8)	-1.176317	1.032375	-1.139429	0.2554
C(9)	-0.441060	0.975283	-0.452238	0.6514
C(10)	-2.317666	1.161860	-1.994789	0.0469
C(11)	-0.455439	1.023623	-0.444929	0.6567
C(12)	0.002088	0.000526	3.972124	0.0001
C(13)	0.218547	0.733845	0.297811	0.7660
C(14)	-2.825021	0.709561	-3.981365	0.0001
C(15)	-0.719136	0.554074	-1.297906	0.1953
C(16)	-0.953704	0.554074	-1.721258	0.0862
R-squared	0.237435	Mean dependent var	10.51080	
Adjusted R-squared	0.200298	S.D. dependent var	5.576297	
S.E. of regression	4.986664	Akaike info criterion	6.099533	
Sum squared resid	7658.979	Schwarz criterion	6.286236	
Log likelihood	-972.1243	Durbin-Watson stat	1.799542	

Appendix 4: Results for Linear Probability Model (WLS)

Dependent Variable: TIP

Method: Least Squares

Date: 03/04/05 Time: 14:05

Sample: 1 1458

Included observations: 1458

Weighting series: WGT

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)

*ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)

*SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)

*GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)*TUIT_NPAID

+C(15)*INFREQ+C(16)*DINE_ALONE+C(17)*DINE_10PPL+C(18)

*EXC_SERV+C(19)*POOR_SERV

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.942779	0.052778	17.86315	0.0000
C(2)	0.005601	0.002432	2.303068	0.0214
C(3)	-0.031977	0.012218	-2.617076	0.0090
C(4)	-0.102863	0.018723	-5.493941	0.0000
C(5)	-0.068371	0.036621	-1.867010	0.0621
C(6)	-0.119043	0.025012	-4.759476	0.0000
C(7)	-0.040270	0.016783	-2.399452	0.0165
C(8)	-0.024473	0.017904	-1.366874	0.1719
C(9)	-0.014527	0.016404	-0.885553	0.3760
C(10)	0.014426	0.019274	0.748466	0.4543
C(11)	0.051088	0.022958	2.225319	0.0262
C(12)	-1.68E-05	1.11E-05	-1.509977	0.1313
C(13)	0.007395	0.012022	0.615137	0.5386
C(14)	-0.019838	0.012462	-1.591873	0.1116
C(15)	-0.015473	0.011358	-1.362302	0.1733
C(16)	-0.094418	0.013928	-6.778943	0.0000
C(17)	-0.028456	0.011482	-2.478356	0.0133
C(18)	0.051545	0.011298	4.562276	0.0000
C(19)	-0.524873	0.023497	-22.33798	0.0000

Weighted Statistics

R-squared	0.991679	Mean dependent var	0.874943
Adjusted R-squared	0.991575	S.D. dependent var	2.652439
S.E. of regression	0.243464	Akaike info criterion	0.025253
Sum squared resid	85.29651	Schwarz criterion	0.094122
Log likelihood	0.590697	Durbin-Watson stat	2.007012

Unweighted Statistics

R-squared	0.419638	Mean dependent var	0.781893
Adjusted R-squared	0.412379	S.D. dependent var	0.413102
S.E. of regression	0.316669	Sum squared resid	144.3023
Durbin-Watson stat	2.032741		

Dependent Variable: TIP

Method: Least Squares

Date: 03/04/05 Time: 14:27

Sample: 1 324

Included observations: 324

Weighting series: WGT

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)

*ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)

*SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)

*GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)*TUIT_NPAID

+C(15)*INFREQ+C(16)*INCOME25000

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.061873	0.045682	23.24507	0.0000
C(2)	0.002176	0.001956	1.112125	0.2670
C(3)	0.004002	0.009577	0.417885	0.6763
C(4)	-0.108825	0.022835	-4.765733	0.0000
C(5)	-0.160257	0.047769	-3.354855	0.0009
C(6)	-0.100189	0.023606	-4.244295	0.0000
C(7)	-0.096284	0.023330	-4.127094	0.0000
C(8)	-0.098864	0.024399	-4.051993	0.0001
C(9)	-0.076419	0.023071	-3.312335	0.0010
C(10)	-0.080485	0.024707	-3.257623	0.0012
C(11)	0.015496	0.016542	0.936799	0.3496
C(12)	1.55E-05	9.78E-06	1.579565	0.1152
C(13)	-0.038995	0.013677	-2.851052	0.0047
C(14)	-0.015137	0.011450	-1.321970	0.1872
C(15)	-0.014310	0.009239	-1.548937	0.1224
C(16)	-0.022424	0.009689	-2.314442	0.0213

Weighted Statistics

R-squared	0.986264	Mean dependent var	0.984043
Adjusted R-squared	0.985595	S.D. dependent var	0.736824
S.E. of regression	0.088436	Akaike info criterion	-1.964962
Sum squared resid	2.408825	Schwarz criterion	-1.778259
Log likelihood	334.3239	Durbin-Watson stat	2.139619

Unweighted Statistics

R-squared	0.124711	Mean dependent var	0.969136
Adjusted R-squared	0.082083	S.D. dependent var	0.173217
S.E. of regression	0.165956	Sum squared resid	8.482741
Durbin-Watson stat	2.127685		

Dependent Variable: TIP

Method: Least Squares

Date: 03/04/05 Time: 14:37

Sample: 1 324

Included observations: 324

Weighting series: WGT

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)

*ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)

*SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)

*GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)*TUIT_NPAID

+C(15)*INFREQ+C(16)*BILL\$100

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.944553	0.061865	15.26807	0.0000
C(2)	0.003540	0.002981	1.187590	0.2359
C(3)	-0.030875	0.014170	-2.178875	0.0301
C(4)	-0.054941	0.021842	-2.515435	0.0124
C(5)	-0.144505	0.062856	-2.298974	0.0222
C(6)	-0.041392	0.023214	-1.783045	0.0756
C(7)	-0.004599	0.023568	-0.195133	0.8454
C(8)	-0.029130	0.017449	-1.669482	0.0960
C(9)	-0.060183	0.022383	-2.688753	0.0076
C(10)	-0.036448	0.026401	-1.380550	0.1684
C(11)	0.023824	0.021943	1.085692	0.2785
C(12)	3.13E-05	1.07E-05	2.936875	0.0036
C(13)	-0.080400	0.020791	-3.866964	0.0001
C(14)	0.013357	0.015245	0.876160	0.3816
C(15)	-0.000168	0.009127	-0.018410	0.9853
C(16)	0.023881	0.012591	1.896615	0.0588

Weighted Statistics

R-squared	0.985752	Mean dependent var	0.979108
Adjusted R-squared	0.985058	S.D. dependent var	0.892670
S.E. of regression	0.109119	Akaike info criterion	-1.544638
Sum squared resid	3.667327	Schwarz criterion	-1.357935
Log likelihood	266.2313	Durbin-Watson stat	1.991143

Unweighted Statistics

R-squared	0.110882	Mean dependent var	0.962963
Adjusted R-squared	0.067581	S.D. dependent var	0.189145
S.E. of regression	0.182642	Sum squared resid	10.27425
Durbin-Watson stat	1.973573		

Appendix 4.1: Weighted Least Squares

To adjust for Heteroscedasticity, weighted least square regressions are used as opposed to the ordinary least square methods. Variances are calculated in the form:

$$\text{var}(u_i) = \hat{p}_i(1 - \hat{p}_i)$$

For calculation purposes, \hat{p}_i values larger than one and smaller than 0 are modified.

$\hat{p}_i > 1$ are changed to a value of 0.9 and $\hat{p}_i < 0$ are changed to 0.1. This way calculation can be carried out with the weights being as close to the original values as possible. The adjusted \hat{p}_i values are used to obtain the weights when performing WLS:

$$\text{Weight}(W_i) = \frac{1}{\sqrt{\hat{p}_i(1 - \hat{p}_i)}}$$

Appendix 5: Results for Conditional Model

Dependent Variable: TIP

Method: Least Squares

Date: 02/15/05 Time: 15:20

Sample: 1 1140

Included observations: 1140

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)
 *ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)
 *SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)
 *GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)
 *TUIT_NPAID+C(15)*INFREQ+C(16)*DINE_ALONE+C(17)
 *DINE_10PPL+C(18)*EXC_SERV+C(19)*POOR_SERV

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	8.977525	1.336399	6.717696	0.0000
C(2)	0.130365	0.059098	2.205907	0.0276
C(3)	1.046528	0.308485	3.392478	0.0007
C(4)	-3.426436	0.447513	-7.656620	0.0000
C(5)	-7.120147	0.808470	-8.806936	0.0000
C(6)	-3.166481	0.566026	-5.594235	0.0000
C(7)	-2.443555	0.532256	-4.590944	0.0000
C(8)	-2.214720	0.499605	-4.432943	0.0000
C(9)	0.014301	0.478794	0.029869	0.9762
C(10)	-2.687322	0.553122	-4.858465	0.0000
C(11)	0.737829	0.493147	1.496165	0.1349
C(12)	0.001733	0.000252	6.877494	0.0000
C(13)	0.594568	0.376761	1.578105	0.1148
C(14)	-1.880994	0.347216	-5.417358	0.0000
C(15)	-0.921096	0.275203	-3.346966	0.0008
C(16)	-0.165514	0.337837	-0.489922	0.6243
C(17)	0.554912	0.333398	1.664414	0.0963
C(18)	3.834064	0.302709	12.66585	0.0000
C(19)	-1.944019	0.398102	-4.883220	0.0000
R-squared	0.317670	Mean dependent var	11.41625	
Adjusted R-squared	0.306714	S.D. dependent var	5.568063	
S.E. of regression	4.636181	Akaike info criterion	5.922185	
Sum squared resid	24094.97	Schwarz criterion	6.006165	
Log likelihood	-3356.646	Durbin-Watson stat	0.357486	

Dependent Variable: TIP

Method: Least Squares

Date: 02/15/05 Time: 15:27

Sample: 1 314

Included observations: 314

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)
 *ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)
 *SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)
 *GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)
 *TUIT_NPAID+C(15)*INFREQ+C(16)*INCOME25000

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	12.85180	2.352535	5.462959	0.0000
C(2)	0.101583	0.106562	0.953272	0.3412
C(3)	0.265949	0.530374	0.501436	0.6164

C(4)	-4.664650	0.817541	-5.705708	0.0000
C(5)	-9.753316	1.500704	-6.499159	0.0000
C(6)	-4.618798	0.983127	-4.698069	0.0000
C(7)	-4.680867	0.965841	-4.846416	0.0000
C(8)	-3.216866	0.915585	-3.513454	0.0005
C(9)	-1.799319	0.863098	-2.084720	0.0379
C(10)	-4.009803	1.010573	-3.967851	0.0001
C(11)	0.190325	0.899955	0.211483	0.8327
C(12)	0.002548	0.000459	5.546835	0.0000
C(13)	1.651232	0.654428	2.523168	0.0122
C(14)	-3.233381	0.622868	-5.191116	0.0000
C(15)	-0.320334	0.490521	-0.653049	0.5142
C(16)	-1.291073	0.490852	-2.630268	0.0090
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R-squared	0.310326	Mean dependent var	11.24841	
Adjusted R-squared	0.275610	S.D. dependent var	5.102347	
S.E. of regression	4.342662	Akaike info criterion	5.824464	
Sum squared resid	5619.898	Schwarz criterion	6.015516	
Log likelihood	-898.4408	Durbin-Watson stat	0.599097	

Dependent Variable: TIP

Method: Least Squares

Date: 02/15/05 Time: 15:32

Sample: 1 312

Included observations: 312

TIP=C(1)+C(2)*AGE+C(3)*MALE+C(4)*ORIGIN_ASIA+C(5)

*ORIGIN_OTHER+C(6)*HUMANITIES+C(7)*NAT_SCIENCE+C(8)

*SOC_SCIENCE+C(9)*COMM+C(10)*MAJOR_OTHER+C(11)

*GRAD+C(12)*INCOME+C(13)*HOUS_NPAID+C(14)

*TUIT_NPAID+C(15)*INFREQ+C(16)*BILL\$100

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	9.419727	2.509127	3.754185	0.0002
C(2)	0.233766	0.113573	2.058286	0.0404
C(3)	0.849955	0.571376	1.487559	0.1379
C(4)	-4.730534	0.856773	-5.521339	0.0000
C(5)	-7.420962	1.595680	-4.650657	0.0000
C(6)	-4.238756	1.041112	-4.071372	0.0001
C(7)	-3.816959	1.003172	-3.804891	0.0002
C(8)	-1.105482	0.951497	-1.161835	0.2462
C(9)	0.497337	0.931426	0.533952	0.5938
C(10)	-2.109094	1.076307	-1.959566	0.0510
C(11)	-0.783406	0.962049	-0.814310	0.4161
C(12)	0.001568	0.000491	3.193268	0.0016
C(13)	1.308083	0.711602	1.838223	0.0670
C(14)	-3.394663	0.668011	-5.081744	0.0000
C(15)	-0.648329	0.523592	-1.238232	0.2166
C(16)	-1.391707	0.523981	-2.656026	0.0083
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R-squared	0.271010	Mean dependent var	10.91506	
Adjusted R-squared	0.234068	S.D. dependent var	5.279031	
S.E. of regression	4.620079	Akaike info criterion	5.948621	
Sum squared resid	6318.159	Schwarz criterion	6.140570	
Log likelihood	-911.9849	Durbin-Watson stat	0.492670	